# Food Technology Abstracts

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for Food Science and Technology,
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# Food Technology Abstracts

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## GENERAL

1786 MADHU BALA. Wealth from agro-industrial waste. *Yojana.* 24(10); 1980; 11-4
Use of wastes like coconut husk and pith, wood waste, bagasse, jute sticks, groundnut husk, rice husk, arecanut husk have been reviewed. KAR

1787 CHELLAPPA (S) and SRINIVASAN (D). Wealth from agricultural waste. *Indian Chem. J.* 15(6); 1980; 27-30
The author has outlined the possibilities of utilizing agricultural and food processing wastes for the manufacture of the following products: ethanol; rice bran oil; fertilizers by growing algae on sewage; plastics; paper; oxalic and acetic acids; furfural; single cell protein as well as fat. Various wastes available from fruit processing factories such as pineapple waste, grape seeds, mango kernel flour, and citrus peels, could be used for manufacturing different products. KMD

1788 INNS (FM). Animal power in agricultural production systems. *World Anim. Rev.* No. 34, 1980, 2-10

1789 TOLSTOGUZOV (VB). Synthetic foods. 2. Possibilities of producing some synthetic foods. *Nahrung.* 23(8); 1979; 821-7 (German)
The research program elaborated in the Institute of Element-Organic Compounds of the Academy of Sciences of the USSR (INEOS) for the processing of proteins to liquid multi component-food-systems and their transformation into a gel-like condition became a kind of an independent scientific discipline. Thus production processes for different forms of artificial food on the basis of proteins of different origin could be developed. AA

1790 SCHOENHERR (WH). Food purity and compliance. *MBAA Tech. Quart.* 17(1); 1980; 13-5

## FOOD PROCESSING AND PACKAGING

1791 BAISYA (RK). Fruit and vegetable processing industry in rural India : Its problems and prospects. *Indian Food Packer.* 34(6); 1980; 29-32
Aspects covered include: availability of fruits and vegetables; present status of the industry; export of processed fruits and vegetables and problems faced by processing industries and the opportunities available. BSN

1792 NATARAJAN (CP) and SHANKAR (JV). Nutritional consequences of primary processing of foodgrains in India. *Indian Food Packer.* 34(6); 1980; 44-60
Aspects covered under cereals and millets include, rice milling, parboiling, washing and cooking, rice bran utilization, wheat milling, milling of jowar, bajra, maize and ragi. Other aspects discussed are milling and heat processing of pulses, malting of cereals and germination of pulses and improving the nutritional value by cereal-pulse blending. BSN

1793 DAGERSKOG (M) and OSTERSTROM (L). Infra-red radiation for food processing. I. A study of the fundamental properties of infra-red radiation. *Food Sci + Technol.* 12(4); 1979; 237-42
The optical properties of infra-red radiation in the near infra-red part of the spectrum were studied in relation to some common food products. The experimentally determined transmission values could be fitted to exponential equations with high accuracy if the radiation was separated in at least two wavelength regions. The penetration capacity of the short-wave ( $< 1.25 \mu$) radiation was about 10 times higher than of the long-wave ( $> 1.25 \mu$) radiation.

Measured penetration depths (37%) unabsorbed radiation remaining) for the short-wave radiation were 4.8, 2.4 and 6.3 mm for potato, pork and wheat bread. Reflectance measurements showed high reflectance (30-60%) below and low reflectance (~10%) above 1.4μ. Influence of layer thickness on reflectance was also studied by the use of a simple computer program, taking into account the internal scattering. AA

1794 PARCELL (G). Cleaning technique. *Food Process. Ind.* 49(585); 1980; 31,35,37 & 39

Discusses the subject of cleaning plan in food processing industry under the following aspects; tray washing technology; ultrasonic process; customer view point; invaluable foam; effluent problem; safety aspects and carbon recovery. BSN

1795 HAYAKAWA (K-I). Computer programs for estimating transient state temperatures at any location in thermally conductive foods of simple configurations. *Food Sci + Technol.* 12(4); 1979; 208-11

Three different computer programs were developed for estimating transient state heat conduction in an infinite cylinder, infinite slab, or sphere. This development was based on the use of an analytical formula for the heat conduction in each assumed geometrical body which was suddenly exposed to zero surrounding medium temperature while the internal temperature of the same body was uniformly equal to unity at the zero time of this exposure. One of the programs was used to simulate several cooling processes applied to fresh firm-ripe tomatoes. AA

## *PACKAGING*

1796 NOGUCHI (A), ITAMI (H) and YOKOKURA (S). New method for measuring the impact strength of glass containers. *MBAA Tech. Quart.* 17(1); 1980; 49-52

Reports a new and simple method for measuring impact strength by allowing bottles released from 15 or 16 C angle to fall and impact horizontally on an acrylic board or iron board a certain number of times. The thickness of the board employed was from 15-50 mm. The method is applicable to various kinds of bottles. BSN

1797 HOLLIFIELD (HC), BREDER (CV), DENNISON (JL), ROACH (JAG) and ADAMS (WS). Container-derived contamination of maple sirup with methyl methacrylate, toluene and styrene as determined by headspace gas-liquid chromatography. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 173-7

Samples of maple sirup and associated plastic packaging were examined for the presence of methyl methacrylate, toluene, and styrene by a head space gas chromatographic procedure. The volatile components common to the sirup and the plastic container were identified by gas chromatography-mass spectrometry. The quantities of these contaminants in the sirup were determined at ppb levels by the standard additions technique and repetitive headspace analysis. AA

1798 HOPPE (H) and ROMMINGER (K). Evaluation of the use of cadmium pigments for colouring plastics used for the manufacture of vessels in daily use. *Nahrung.* 23(8); 1979; 785-95 (German)

The authors report of studies bearing on the release of cadmium from plastic materials coloured with cadmium pigments. From the results obtained, the following conclusions may be drawn: Low-density polyethylene and high-density polyethylene intended for the manufacture of commodities may be coloured with cadmium pigments under certain conditions. The present findings indicate that this is also true of polystyrene and polypropylene; nevertheless, more extensive studies are needed to give a definite judgment. The cadmium pigment

content in the plastic should not exceed 0.5% calculated as cadmium. The present tolerance of 0.5% for the amount of cadmium soluble in 0.1 N HCl in the pigment should be kept up. With reference to extent legal regulations (service test) and additional consideration of the light-dependence of cadmium migration, the following conditions are proposed for tests designed to control the observance of the legal tolerance level: test liquid: 3% acetic acid; contact: 100 $cm^2$/100 ml; duration of contact: 10 days; temperature: 22 C ± 2 C; illumination intensity: 100 luxes. The results from migration experiments do not allow to approve of the use of cadmium pigments for the manufacture of commodities. The manufacture of vinegar bottles of plastics containing cadmium pigments must be disapproved irrespective of the type of plastic. AA

1799 KASHTOCK (M) and BREDER (CV). Migration of ethylene glycol from polyethylene terephthalate bottles into 3% acetic acid. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 168-72

Migration of ethylene glycol (EG) from polyethylene terephthalate (PET) bottles into the food simulant 3% acetic acid was studied using 32 fluid oz PET bottles filled with 3% acetic acid and stored at 32 C for 6 months. Final concentration of EG in the 3% acetic acid migration solution was about 100 ppb, which is equivalent to about 94 µg EG/bottle. A gas-liquid chromatographic procedure for quantitating EG was developed which is capable of measuring EG levels as low as 50 ppb in the migration solution. AA

1800 SAHU (GN). Packaging - a key to sales promotion. *Indian J. Mark.* 11(8); 1981; 13-6, 20

# FOOD ENGINEERING AND EQUIPMENT

1801 ALIMOV (AK), DRABKIN (LM), UMAROV (GY) and KHATAMOV (PU). Some test results for a solar turbogenerator. *Appl. Solar Energy.* 16(1); 1980; 36-8

1802 GARLAND (MW). Partial load operation : Compressor capacity control for air-conditioning systems. *Ashrae J.* 22(4); 1980; 37-9

1803 SCHROPP (HP). Aspects of rational use of energy in cellarage and bottling undertakings. *Flussiges Obst.* 46(11); 1979; 436-44 (German)

Two factors are important in the evaluation of a fuel: the heating value and the price of heat. It must be noted that the calorific value which is indicated for natural gas is often quite different from its heating value. The great majority of losses occurring in the production and utilization can be avoided by appropriate measures which have been described. Centralization of the refrigeration installation has decisive advantages. Electricity consumption should be so.controlled that the operating time is extended and peak loads are avoided. A maxima indicating device is indispensable for this purpose. KMD

## *EQUIPMENT*

1804 PINSON (GS). A pedal operated grain mill. *Trop. Sci.* 21(2); 1979; 71-3

A high-speed mill for grinding hard brittle grains such as maize, millet or sorghum, has been developed, using a bicycle or substitute wooden frame. Instructions and diagrams for its piece-by-piece manufacture can be obtained from the Tropical Products Institute, 56/62 Gray's Inn Road, London, WCI X8LU. A flour of the required fineness can be obtained as a result of impact with a

rapidly rotating arm. KMD

1805 BLACK (HC), HSIEH (FH), MARTIN (DG) and TIPPLES (KH). Two grain research laboratory research mills and a comparison with the Allis-Chalmers mill. *Cereal Chem.* 57(6); 1980; 402-6

Two laboratory research mills with roll diameters of 6 in. (152 mm) and 10 in. (254 mm) were developed. They are very flexible and have a wide range of selections for feed rate, roll gap, roll speed, and roll differential. Changes from one set of selections to another can be made easily. A mill comparison study showed them to be comparable in performance to the Allis-Chalmers laboratory mill. AA

1806 NGIAN (KF) and MARTIN (WRB). Biologically active fluidized beds: Mechanistic considerations. *Biotechnol. Bioeng.* 22(5); 1980; 1007-14

1807 STEINDREISCHER (R). Bottle sorting nowadays. *Flussiges Obst.* 46(11); 1979; 430-6 (German)

The author has described the essential characteristics of a bottle sorting plant, including both the examining (or recognizing) devices and the sorting out process. KMD

## FOOD CHEMISTRY AND ANALYSIS

1808 PANDELL (AJ), MONTGOMERY (RA) and MEISSNER (RA). Improved method for detecting microgram amounts of iron. *Analyst.* 105(1247); 1980; 181-4

1809 HAYAKAWA (K-I), BIRAN (D), VACCARO (E) and GILBERT (SG). Development of a new procedure for direct determination of respiration heat generation by fresh produce. *Food Sci + Technol.* 12(4); 1979; 189-93

A sample of the produce is placed in a 5 litre Dewar flask, which is covered with an expanded polystyrene lid. Oxygen gas is supplied to the flask through a flow meter, at a rate close to that of the $O_2$-consumption of the produce. The relative humidity and $CO_2$ concentration of the air surrounding the sample are kept at proper levels by using $K_2SO_4$ aqueous slush, and 30% KOH aqueous solution respectively. The rates of heat generation by mature green tomatoes (Ace variety) and of mature potatoes (Bintjes variety) have been determined. A reasonably good agreement has been found with the results already published. KMD

1810 BUDINI (R), TONELLI (D) and GIROTTI (S). Analysis of total phenols using the prussian blue method. *J. Agric. Food Chem.* 28(6); 1980; 1236-8

The colour development as prussian blue complex formed by vegetable phenolics does not interfere with the commonly occurring substances except ascorbic acid. The method is ~20 times as sensitive when compared to acidified vanillin technique and to three times to that of the titanium method. For a rapid estimation of total phenolics in straw berries the prussian blue method with a simple extraction procedure was found efficient. BSN

1811 HORVAT (RJ) and SENTER (SD). A gas-liquid chromatographic method for analysis of phenolic acids in plants. *J. Agric. Food Chem.* 28(6); 1980; 1292-5

The GLC-Ms method reported involves extraction of phenolic acids, conversion to methyl esters by refluxing in 3M hydrogen chloride in methanol and reaction of esters with bis (trimethylsilyl) trifluoracetamide and 10% trimethylchlorosilane to silylate and phenolic groups. Derivatives of standard

p-hydroxybenzoic, gallic, ferulic, sinapic, caffeic, p-coumaric, gentistic and protocatechuic acids prepared by this method were subjected to GLC analysis on 3.75 m x 0.032 cm columns of 3% SE-30 and OV-17 on 100-120 mesh Chromosorb W. Presence of p-hydroxybenzoic, coumaric, protocatechuic acids, coumaric, gallic and caffeic acids, and p-hydroxybenzoic, vanillic, coumaric, protocatechuic, syringic, gallic, gentistic and (p-hydroxyphenyl) acetics were found in sphagnum moss, instant tea and stuart pecan kernels respectively. BSN

1812 BASU (RN) and MANDAL (K). A simple method of bioassay of ethylene in plant materials. *Indian J. Exp. Biol.* 18(11); 1980; 1291-3

The inhibition of root and shoot growth of lettuce seedlings exposed to ethylene is the criterion used to estimate the amount of ethylene present in the gaseous emanations of any biological material. Other plants, e.g. the tomato cultivar Marglobe, which have small seeds may be used instead of lettuce. The method eliminates the problems of $CO_2$ stagnancy and though a bit time-consuming, is quite sensitive ( < 1 ppm can be detected), and gives highly reproducible results. KMD

1813 LATTA (M) and ESKIN (M). A simple and rapid colorimetric method for phytate determination. *J. Agric. Food Chem.* 28(6); 1980; 1313-5

The simple rapid colorimetric method is based on the reaction between ferric iron and sulfosalicylic acid. The method was found superior to conventional technique in cereals, legumes and oilseeds for estimation of phytate. BSN

1814 SJODAHL (J). High-resolution liquid chromatography of proteins. *Sci. Tool.* 27(4); 1980; 54-6

When well known physico-chemical models of liquid chromatography are applied to high-molecular-weight substances, the outcome in regard to optimal parameters is as expected; however, these parameters have seldom been realized. A new mode of high-performance liquid chromatography (HPLC) is suggested. In this mode-How Proteins Like to be Chromatographed-chromatographic theory is applied to provide a chromatography system optimized for high-resolution sepa ration of proteins. A protein-optimized system is found to be a low-pressure system involving a peristaltic pump in conjuction with a recently introduced, modern, high-performance, protein-optimized support for gel filtration. The system also includes a detector with recorder and a fraction collector, both being adapted to the demands of high-resolution applications. AA

1815 LINGNERT (H) and ERIKSSON (CE). Antioxidative maillard reaction products. II. Products from sugars and peptides or protein hydrolysates. *J. Food Process. Preserv.* 4(3); 1980; 173-81

The antioxidative properties of maillard reaction products (MRP) were studied. The antioxidative effect was found to be strongly dependent on the choice of reactants, especially the amino acid. MRP from glutamic acid showed the antioxidative properties, while histidine or lysine with any of the 3 sugar showed potent antioxidative property. Influence of pH and molar ratio of amino acid and sugar were studied with histidine and glucose. Neutral pH was found to favour the production of antioxidative products. Antioxidative effect was more when the amino acid concentration was high. Of the sugars used, xylose was found to be the most effective one for forming antioxidative products with glycine. BSN

1816 VELISEK (J), DAVIDEK (J), KUBELKA (V), JANICEK (G), SVOBODOVA (Z) and SIMICOVA (Z). New chlorine-containing organic compounds in protein hydrolysates. *J. Agric. Food Chem.* 28(6); 1980; 1142-4

1817 LANZA (E), ZYREN (J) and SLOVER (HT). Fatty acid analysis on short glass capillary columns. *J. Agric. Food Chem.* 28(6); 1980; 1182-6

1818 VELISEK (J), DAVIDEK (J), KUBELKA (V), BARTOSOVA (J), TUCKOVA (A), HAJSLOVA (J) and JANICEK (G). Formation of volatile chlorohydrins from glycerol (Triacetin, tributyrin) and hydrochloric acid. *Food Sci + Technol.* 12(4); 1979; 234-6

The volatile reaction products of glycerol (triacetin, tributyrin) and hydrochloric acid were isolated, separated and analyzed by gas chromatography and combined gas chromatography - mass spectrometry. Three of the thirteen identified chlorine compounds were previously reported as constituents of protein hydrolysates. Seven acetates and butyrates of glycerol chlorohydrins were identified for the first time. It was suggested that these compounds could be the precursors of glycerol chlorohydrins and constitute important toxic components of protein hydrolysates. AA

## FOOD MICROBIOLOGY

1819 BIRNBAUM (A), DORREICH (K), LY (TB), SABIR (DM), WADUD (S) and GIERSCHNER (K). Contribution to the enzymatic determination of galacturonic acid (GA). *Food Sci + Technol.* 12(4); 1979; 231-3 (German)

Based on the fact, that pectin contains also parts of neutral polysaccharids within the chain, it is desirable to determine the galacturonic acid residues of the pectin chain. One strain of microorganisms (*Bacillus polymyxa*) described in the literature, was tested and the cultural conditions were analysed; it was found that the species of the used strain has more influence than the cultural conditions. It is possible to store the concentrated enzyme solution at -18 C without loosing activity at least for one month. The specifity for GA was confirmed. AA

1820 MORIKAWA (Y), KARUBE (I) and SUZUKI (S). Continuous production of bacitracin by immobilized living whole cells of *Bacillus* sp. *Biotechnol. Bioeng.* 22(5); 1980; 1051-23

1821 HOM (SSM), HENNECKE (H) and SHANMUGAM (KT). Regulation of nitrogenase biosynthesis in *Klebsiella pneumoniae*: Effect of nitrate. *J. Gen. Microbiol.* 117(1); 1980; 169-79

1822 VANCE (I), TOPHAM (CM), BLAYDEN (SL) and TAMPION (J). Extracellular cellulase production by *Sporocytophaga myxococcoides* NCIB 8639. *J. Gen. Microbiol.* 117(1); 1980; 235-41

1823 GARG (SK) and NEELAKANTAN (S). Production of fungal protein on cellulosic substrate. *J. Food Sci. Technol. (India).* 18(2); 1981; 64-5

5 celluloytic fungi were isolated from soil and decaying plant materials and characterized as *Aspergillus terreus* GN1, *Aspergillus sydowi* GN2, GN3, GN4 and *Fusarium* sp. GN5. These cultures and other cultures collected from different laboratories were screened for protein production on cellulosic substrate. The crude protein content of the biomass produced by these cultures using untreated bagasse and alkali-treated bagasse, as a sole carbon source was in the range of 2.41-5.40 and 5.39-19.88% respectively. Maximum crude protein was present in the biomass produced by *Aspergillus terreus* GN1. Pretreatment of bagasse with 4.0% NaOH and autoclaving for 30 minute showed considerable increase in cellulose utilization and increase in crude protein content. AA

1824 SENEZ (JC), RAIMBAULT (M) and DESCHAMPS (F). Protein enrichment of starchy substrates for animal feeds by solid-state fermentation. *World Anim. Rev.* No.35; 1980; 36-9

Starchy materials like cassava, banana, potato, or even banana or potato wastes, can be fermented (in solid state) by means of a highly amylolytic strain of *Aspergillus niger* to produce, in one step an animal feed with 17-20% protein. An outline of the fermentation technique has been given and the agro-economic perspectives of the process have been discussed in detail. Such a fermented product could be twice as valuable as soyabeans for animal feeding. KMD

1825 BHATIA (YS). Production of ethanol from plant biomas. *Indian Chem. J.* 15(6); 1980; 31-6

1826 WHITAKER (A). Fed-batch culture. *Process. Biochem.* 15(4); 1980; 10-5, 32

1827 CARLEYSMITH (SW), EAMES (MBL) and LILLY (MD). Staining method for determination of the penetration of immobilized enzyme into a porous support. *Biotechnol. Bioeng.* 22(5); 1980; 957-67

1828 DO (DD) and WEILAND (RH). Consistency between rate expression for enzyme reactions and deactivation. *Biotechnol. Bioeng.* 22(5); 1980; 1087-93

1829 KELSEY (RG) and SHAFIZADEH (F). Enhancement of cellulose accessibility and enzymatic hydrolysis by simultaneous wet milling. *Biotechnol. Bioeng.* 22(5); 1980; 1025-36

1830 PUVANAKRISHNAN (R) and BOSE (SM). Studies on the immobilization of trypsin on sand. *Biotechnol. Bioeng.* 22(5); 1980; 919-28

1831 BREMEL (RD). Membrane filter-deoxyribonucleic acid method of somatic cell counting: Collaborative study. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 211-8

In the membrane filter - DNA (MF-DNA) test, somatic cells are trapped on a special filter. A chemical determination of the DNA of the trapped material gives an estimate of the number of cells. The MF-DNA was evaluated and compared with direct microscopic somatic cell counts. The error of the MF-DNA was constant at all cell counts, whereas there was a tendency for the error to increase in the DMSCC method at high cell counts. This is applicable to dairy laboratories for cell counting and testing. The capacity of the MF-DNA procedure is not so great as the electronic systems, but the equipment needed is simpler and less expensive, well suited for smaller laboratories. BSN

## MUSHROOM

1832 GORMLEY (TR) and MacCANNA (C). Canning tests on mushroom strains. *Irish J. Food Sci. Technol.* 4(1); 1980; 57-64

Canning tests were carried out on 5 mushroom strains from 2 flushes of 4 separate crops. Particular attention was given to the ratio of whole closed canned mushrooms to that of whole closed canned mushrooms plus canned stems and pieces - i.e. total yield. Factors considered in the tests included grading prior to processing, blanching and retort losses, shrinkage in size and mushroom whiteness. Cream and off-white strains had the highest level of open and misshapen mushrooms prior to processing and a brown strain the lowest. Blanching losses, which comprised shrinkage and mushrooms that opened during blanching, ranged from 37.8% for the cream strain to 22.7% for the brown strain. Values for shrinkage during blanching were similar for the 5 strains with a

mean of 19.2% loss in weight. Shrinkage during retorting ranged from 15.0% for the off-white-2 strain to 11.4% for the cream strain. Strains which showed a relatively low level of shrinkage during blanching had a relatively high shrinkage during retorting and combined shrinkage values for blanching and retorting were similar, ranging from 31.5 to 34.0%. The brown strain gave the highest yield of whole closed canned mushrooms at 54.8% and the cream strain the lowest at 45.0%. Corresponding yields of canned stems and pieces were 16.0 and 24.8% respectively. Total yield values for all strains were similar, ranging from 69.7% to 70.8%. Most shrinkage in mushroom size took place during blanching. Colour of the canned mushrooms of the 5 strains was considered acceptable by a sensory panel. AA

1833 FROST (RR). Mushroom viruses : Do they cause disease? *Mushroom J.* 87; 1980; 90-100

1834 GUYOD (JLB), BENKHEDER (K), MURANDI (FS) and DUC (CL). Differential identification of toxic mushrooms by pyrolysis-GLC coupling. *J. Agric. Food Chem.* 28(6); 1980; 1317-9

## FOOD ADDITIVES

1835 ARYA (SS). Stability of sorbic acid in aqueous solutions. *J. Agric. Food Chem.* 28(6); 1980; 1246-9

Oxidative degradation of sorbic acid in aqueous solution leads to autoxidation ending up with formation of malonaldehyde and other carbonyls. The degradation follows first order reaction kinetics and the rate of reaction decreases with rise in pH. Excepting histidine and arginine, other amino acids increase, while NaCl, KCl, sucrose and trace metal ions ($Cu^{2+}$, $Fe^{2+}$, $Mn^{2+}$) decrease the rate of degradation of sorbic acid. Acetic acid, glycerol and most of the salts examined enhance the rate of degradation. BSN

1836 HARADA (K). Microbial degradation of nitrosamines. II. Effect of the conditions of growth and enzymic reaction on the nitrosamine breakdown. *Bull. Jpn. Soc. Sci. Fish.* 46(6); 1980; 723-6

The effect of growth conditions of *Rhizopus oryzae* and enzymic reaction conditions in the cell-free extract on the degradation of NDMA and NDPA has been investigated. Optimal concentration for NDMA and NDPA degradation was 0.03-0.12 and 0.1 mM respectively. Nitrosamine degradation was high in the concentration of more than 0.1 mM. KAR

1837 HOLAK (W) and KRINITZ (B). Differential pulse polarographic determination of saccharin in foods. Collaborative study. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 163-7

An improved differential pulse polarographic method for the determination of saccharin in foods has been developed. The sample (if solid) is blended with water; an aliquot is acidified with HCl, mixed with Celite, transferred to a chromatographic column, and eluted with chloroform. After chloroform is evaporated with a current of air, the residue is dissolved in 0.1N NaOH, and an aliquot is polarographed in a supporting electrolyte composed of 0.1N HCl 0.1N KCl, and 0.1% tetrabutylammonium bromide. The method is sensitive, relatively precise, and applicable to a wide variety of foods. A collaborative study has been conducted and the results indicate average recoveries of 101.5 99.8, 96.9, 91.9 and 95.3%, respectively, for samples containing saccharin from 0.028 to 1.4%. The method has been adopted as official first action. AA

1838 KAWASHIMA (K), ITOH (H), YONEDA (N), HAGIO (K), MORIYA (T) and CHIBATA (I). An intensely sweet analogue of Kynurenine: 3-(4-Chloroanthranniloyl)-DL-alanine. *J. Agric. Food Chem.* 28(6); 1980; 1338-40

A new Kynurenine derivative 3-(4-Chloroanthranniloyl)-DL-alanine synthesized from 6-Chloro-DL-tryptophan, was found to be 80 times sweeter than sucrose as assessed by organoleptic studies. BSN

1839 THIER (E). Position and characterization of sweeteners in the new food legislation. *Dtsch. Lebensmittel Rundschau.* 76(7); 1980; 238-42 (German)

A survey has shown that various forms of sugar are the only sweeteners known to the average consumer; this is because items like sorbitol, cyclamates, invert liquid sugar, glucose, iso-glucose are used only by the food industry, the consumer does not purchase them on the market for his own use. Only the new regulations on sweeteners have made the position somewhat clear, and the author has listed the different pieces of legislation relating to sweeteners under nine different headings. Which sweetener is permitted in which product depends not only on the method of preparation of the food product, but also on the age of the legislation relating to it. KMD

1840 RUDDICK (JA), CRAIG (J), STAVRIC (B), WILLES (RF) and COLLINS (B). Uptake, distribution, and metabolism of ($^{14}$C)-amaranth in the female rat. *Food Cosmet. Toxicol.* 17(5); 1979; 435-42

Experiments have shown that the presence of food in the gastro-intestinal tract alters the uptake and/or elimination of amaranth (FD and C Red No.2). This would explain why a considerable controversy has arisen regarding the potential toxicity of amaranth. Further studies are necessary to elucidate the interactions between diet and the pharmacokinetics of amaranth. KMD

## CEREALS

1841 DENT (RG). Extraction of light filth from barley, oatmeal and mixed dry infant cereals; Collaborative study. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 187-8

A new method developed for the extraction of light filth from oatmeal, infant cereals, barley and mixed dry infant cereals involves HCl digestion followed by wet sieving. The residue is defatted in a paper cup, using isopropanol and transferred to a 2L wildman trap flask with 40% isopropanol. Filth elements are extracted with light mineral oil. Toxic solvents are not used in this method. BSN

1842 JASBIR SINGH. Quality control of foodgrains. *Foodcrop.* 11(1-2); 1981; 13-4

### *RICE*

1843 AL-BAYATI (SH) and AL-RAYESS (H). The chemical composition of Iraqi rice and rice by-products. *J. Food Sci. Technol. (India).* 18(2); 1981; 40-4

The contents of protein, fat, fibre, ash and N free extracts (NFE) and minerals (K, Si, Mg, P, Na, Ca, Zn, Mn and Fe) in (i) brown rice, (ii) milled rice, (iii) rice bran and (iv) husk were determined in 7 Iraqi rice varieties (Anbar first and second grade, Basmati, Yareat IR 8, Khraiba, Naima and Hwezawi). Protein contents of (i) and (ii) have significantly negatively correlated with NFE. Milled rice of all varieties contained lowest amount of Ca, K, Mg and P while bran contained maximum of these minerals. KAR

1844 GUPTA (OP), RATHOR (GS) and GUPTA (AK). A note on effect of zinc fertilization on the quality of rice. *Sci. Cult.* 46(12); 1980; 438

The effect of Zn fertilization at 0, 5 and 10 p.p.m. levels as zinc sulphate on the quality of rice (Jaya variety) was investigated. The quantity of protein and the dry weight of grain was not affected by Zn. Zn treatments did not also influence gelatinisation temperature. However, the total Zn and amylose contents significantly increased at 10 p.p.m. of Zn application. . The amylose content which is influenced by Zn has relation with the eating quality (cohesiveness, tenderness and glossiness) of cooked rice. MVG

1845 HAYABUCHI (H), YOSHIMURA (T) and KURATSUNE (M). Consumption of toxic rice oil by 'Yusho' patients and its relation to the clinical response and latent period. *Food Cosmet. Toxicol.* 17(5); 1979; 455-61

1846 YAJURVEDI (RP). Microbiology of idli fermentation. *Indian Food Packer.* 34(6); 1980; 33-8

This review covers, steps in idli fermentation, organisms involved in fermentation and changes brought about in nutritive value. BSN

## WHEAT

1847 O'CONNELL (BT), RUBENTHALER (GL) and MURBACH (NL). Evaluation of a nephelometric method for determining cereal alpha-amylase. *Cereal Chem.* 57(6); 1980; 411-5

A nephelometric assay adapted from a clinical method was evaluated for suitability in determining α-amylase levels in sprouted soft white wheat. In the manual mode of machine operation, the velocity of decline in light scattering was directly proportional to the amount of enzyme assayed. The accurate limits of the assay performed in the automated mode were defined as 0-720 machine units of activity, with a commercial β-limit dextrin as substrate. This substrate was more reactive than amylopectin and less subject to β-amylase interference. The automated assay yielded data that correlated highly with falling number results. AA

1848 JOHNSTON (RA), QUICK (JS) and DONNELLY (BJ). Note on comparison of pigment extraction and reflectance colorimeter methods for evaluating semolina color. *Cereal. Chem.* 57(6); 1980; 447-8

1849 SCOTT (PM) and LAWRENCE (GA). Analysis of ergot alkaloids in flour. *J. Agric. Food Chem.* 28(6); 1980; 1258-61

Liquid chromatography (LC) with fluorescence detector enabled analysis of wheat flour for presence of ergot alkaloids. Recoveries of ergometrine added earlier at concentrations of 3.1 and 9.4 μg/kg were 66-72%, whereas recoveries of ergotamine, α-ergokryptine, ergocristine, ergosine and ergocornine at levels of 14-16 and 41-48 μg/kg were 73-93%. The major alkaloid detected in commercial wheat and rye flour was ergocristine (upto 62 μg/kg) with LC patterns similiar to those of wheat ergot sclerotia. BSN

1850 SIDHU (JS), HOSENEY (RC), FAUBION (J) and NORDIN (P). Reaction of $^{14}$C-cysteine with wheat flour water solubles under ultraviolet light. *Cereal Chem.* 57(6); 1980; 380-2

Cysteine and glutathione reacted with $^{14}$C-fumaric acid when exposed to ultraviolet (UV) irradiation. The UV irradiation presumably initiated a free radical on the sulfhydryl group, which then added to the activated double bond of fumaric acid. Ferulic acid and *trans*-cinnamic acid, both of which contain activated double bonds, affected dough mixing tolerance in a manner similar

to that of fumaric acid. UV irradiation of wheat flour water solubles, in the presence of $^{14}C$-cysteine, followed by fractionation of the water-soluble fraction on Sepharose 4B showed that most of the bound radioactivity was eluted at the void volume of column. This result was expected for cysteine reacting with ferulic acid esterified to the water-soluble arabinoxylan. This finding suggests that ferulic acid is an indigenous activated double bond compound that affects mixing tolerance and also provides a mechanism by which pentosans are covalently bound to proteins during dough mixing. AA

851 VIDYASAGAR (K) and ARYA (SS). Effect of sorbic acid on the chemical and rheological changes during mixing and chapati baking. *J. Food Sci. Technol. (India).* 18(2); 1981; 62-3

Addition of sorbic acid at 0.2% level to the wheat flour (*atta*) chapati dough did not influence the rate of amylolysis of polysaccharides, changes in protein extractability in water, 70% alcohol and acetic acid during dough mixing, extensibility, resistance to extension and gelatinization viscosity of wheat flour. Sorbic acid when mixed at 0.15-0.48% level showed decrease in dough development time and mixing tolerance of dough, but did not affect sulphydryl groups. KAR

852 ZIMMERMANN (R) and LANGE (D). Effects of swelling agents as components in wheat dough. *Nahrung.* 23(8); 1979; 807-12 (German)

The addition of 2-5% of pregelatinized rye or wheat flour, pregelatinized maize or potato starch, carboxymethyl starch (CMS) or carboxymethyl cellulose (CMC) during wheat dough making (farinograph technique) leads to a concentration-dependent increase in water uptake (0.5-15%), to a prolongation of dough development and resistance and to more marked dough softening (if starch-base swelling agents are added), especially after dough relaxation or fermentation. There was a decrease, ranging from 0 to 5% in bread volume. AA

1853 BIETZ (JA) and WALL (JS). Identity of high molecular weight gliadin and ethanol-soluble glutenin subunits of wheat: Relation to gluten structure. *Cereal. Chem.* 57(6); 1980; 415-21

The exact relationship, origin and function of high molecular weight gliadin (HMWG) and ethanol-soluble reduced glutenin (ESRG), two heterogeneous wheat protein fractions, are not known. HMWG occurs as small oligomers, soluble in 70% ethanol, whereas ESRG is a disulfidebonded fraction of glutenin, wheat's highest molecular weight protein class. Upon reduction and alkylation, both fractions are alcohol-soluble, consist of subunits having molecular weights near 44,000 and 36,000, and have similar electrophoretic and chromatographic properties and amino acid compositions. Amino-terminal sequence analyses now prove that many of the same polypeptides comprise HMWG and ESRG. Their N-terminal sequence distribution is $H_2N$-(Val+Asn+Gln+Met)-(His+Gln+Met)-(Ile+Val)-(Pro+Val+Gln)-(Gly+Val+Gln+Asn)-(Leu+Pro)-Gln-(Leu+Gly)-(Pro+Gln+Leu)-(Gln+Pro+Val)-Gln-(Gln+Pro)-(Gln+Pro)-Pro-(Gln+Leu)-Pro-Gln-Gln-. These data imply that many of these polypeptides are homologous and that the heterogeneity of HMWG and ESRG results from duplication and mutation of a common ancestral gene. During biosynthesis, kernel maturation, or drying, these polypeptides can combine either with each other to form HMWG or with higher molecular weight ethanol-insoluble polypeptides and with highly aggregating polypeptides to form glutenin. A hypothesis explains how the ethanol-soluble nongliadin polypeptides with 44,000 and 36,000 molecular weight contribute to gluten's structure and to dough's unique viscoelastic properties. AA

1854 ELIASSON (AC) and HEGG (P-O). Thermal stability of wheat gluten. *Cereal Chem.* 57(6); 1980; 436-7

The thermal behaviour of gluten was studied with differential scanning calorimetry in the temperature range 30-115 C. Four endothermic peaks were registered. The peaks at 64.6 and 111.8 C were assigned to thermal transition in starch, whereas the peaks at 88.4 and 101.4 C were assigned to transitions in the gluten proteins. The apparent enthalpies of the protein transitions were, however, very small. These small enthalpies do not support the idea of protein denaturation as an important factor in the baking process. AA

1855 ELIASSON (AC), CARLSON (TL-G), LARSSON (K) and MIEZIS (Y). Some effects of starch lipids on the thermal and rheological properties of wheat starch. *Starch.* 33(4); 1981; 130-4

The lipids present in the outside of wheat starch granules were extracted by isopropanol and those in the amylose-lipid complexes by water-saturated butanol. The amylose-lipid complexes influence both the thermal properties (as measured by scanning calorimetry) and the viscosity of the starch. Starch with a larger amount of lipids soluble in water-saturated butanol began to gelatinize at a higher temperature and the gelatinization enthalpy was lower. The viscosity, too, began to increase at a higher temperature and its maximum was attained at a higher temperature. KMD

1856 OBUCHOWSKI (W) and BUSHUK (W). Wheat hardness : Comparison of methods of its evaluation. *Cereal. Chem.* 57(6); 1980; 421-5

Twelve measurements obtained with two different models of the Brabender Hardness Tester, two (new and used) Strong Scott Barley Pearlers and a Brabender Quadrumat Junior mill, were assessed for their potential an indices of wheat grain hardness and for their ability to differentiate cultivars within a wheat class. The wheat hardness index, flour yield, and grinding torque, all obtained with the two-step Brabender Hardness Tester, gave the same ranking of the cultivars examined. Particle size index, obtained with the Quadrumat mill, also ranked the cultivars in the same order except that the differences between samples were, in some cases, smaller than the experimental error. Pearling resistance index, obtained with the Strong Scott barley pearler, did not give the same ranking as the other methods did. This discrepancy was attributed to differences in bran properties rather than in endosperm hardness The results of all methods of hardness evaluation were dependent on moisture content. The moisture content of maximum discrimination varied somewhat among the methods investigated. AA

1857 OBUCHOWSKI (W) and BUSHUK (W). Wheat hardness : Effects of debranning and protein content. *Cereal. Chem.* 57(6); 1980; 426-8

Wheat hardness measurements on pearled wheat showed that the bran has some effect on the magnitude of the hardness index but essentially no effect on the ranking of cultivars within a group covering soft, hard red spring, and durum classes. Results for nine samples of one variety of hard red spring wheat from one location, all having protein contents in the 9.4-15.6% range, showed that hardness decreases with increasing protein for some indices and remains essentially constant for other indices. Results for all indices on debranned wheat showed that protein content had no effect on endosperm hardness. AA

1858 VOISEY (PW) and KLOEK (M). Note on methods of recording dough development curves from electronic recording mixers. *Cereal. Chem.* 57(6); 1980; 442-4

1859 PRIYADARSHINI (E) and TULPULE (PG). Effect of graded doses of γ-irradiation on aflatoxin production by *Aspergillus parasiticus* in wheat. *Food Cosmet. Toxicol.* 17(5); 1979; 505-7

The use of γ-irradiation can extend the storage life of certain foods, but following irradiation, some foods have been found, under laboratory conditions, to support a greater production of aflatoxin $B_1$. Wheat irradiated at different dose levels up to 250 Krad showed a dose-dependent susceptibility to aflatoxin production, both toxin production and the free fatty acid levels of the wheat grains following an exponential pattern as the irradiation dosage increased from 50 to 250 krad. However, no correlation was observed between the degree of irradiation and the growth of the fungus. AA

1860 LAWRENCE (JF), PANOPIO (LG) and McLEOD (HA). Direct analysis of the wild oat herbicide, asulam, in wheat samples of reversed-phase liquid chromatography at selected ultraviolet wavelengths. *J. Agric. Food Chem.* 28(6); 1980; 1323-5

## BARLEY

1861 BHATTY (RS) and ROSSNAGEL (BG). Lipids and fatty acid composition of riso 1508 and normal barley. *Cereal. Chem.* 57(6); 1980; 382-6

1862 MACGREGOR (AW) and BALLANCE (DL). Hydrolysis of large and small starch granules from normal and waxy barley cultivars by alpha-amylases from barley malt. *Cereal. Chem.* 57(6); 1980; 397-402

α-Amylase I, the minor α-amylase component in malted barley, was more efficient than the major component, α-amylase II, in solubilizing the four types of starch granules studied. Large starch granules from normal barley were particularly resistant to hydrolysis by α-amylase II. No difference was detected by scanning electron microscopy between the action patterns of the two α-amylases on the same starch granules. No characteristic pinholes were observed in degraded small starch granules of either normal or waxy barley, both of which were hydrolyzed by surface erosion. Large degraded granules from normal barley contained many pinholes and appeared to be hydrolyzed from the inside out. Large granules from waxy barley appeared to be degraded by a combination of surface erosion and internal digestion via pinholes from the granule surface. AA

# MILLETS

1863 NOFSINGER (GW), VAN CAUWENBERGE (JE), ANDERSON (RA) and BOTHAST (RJ). Preliminary biological evaluation of the effect of microwave heating on high-moisture shelled corn. *Cereal. Chem.* 57(6); 1980; 373-5

Total mold counts on ambient-dried shelled corn remoistened to 23.6% moisture content were not affected by microwave heating temperatures of 42 and 51 C but were significantly reduced by microwave heating at 62 C. Total mold counts on freshly harvested shelled corn, although not affected by microwave heating temperatures of 55 C and lower, were significantly reduced by microwave heating at 57 C. In three lots of freshly harvested corn kernels (24.0-26.8% initial moisture content), internal molds were reduced from 100 to less than 20% by microwave heating at temperatures of 54-55 C. Germinability of these same lots of corn was significantly reduced at temperatures above 55 C and approached zero at 70 C. AA

## FINGER MILLET (RAGI)

1864 MALLESHI (NG) and DESIKACHAR (HSR). Studies on the suitability of roller flour mill, hammer mill and plate grinder for obtaining refined flour from malted ragi (*Eleusine coracana*). *J. Food Sci. Technol. (India)*. 18(2); 1981; 37-9

Ragi (*Eleusine coracana*) germinated for 72 hour was malted and converted into white flour after moist conditioning using (i) roller flour mill, (ii) hammer mill, and (iii) plate grinder. The yield (%) obtained was 57 with (i), 64 with (ii) and 66 with (iii). The chemical composition of flours obtained in break rolls, reduction rolls, total flour, residues and that of wet processing residue are given. The three fractions obtained in milling of malted ragi using (ii) and (iii) are tabulated. The refined flour was almost free from bran adequate in Ca (about 250 mg %) but slightly low in protein (4.5-5.5%). The bran residues were wet processed to extract an edible fraction with 5-8% yield; this fraction was fairly rich in protein, minerals and P. Flour from (i) was whitest followed by (ii) and (iii). A relative estimate of minute traces of bran in refined flour was made colorimetrically in pigment extraction procedure. KAR

## SORGHUM

1865 ALI (MR) and WILLS (RBH). Effect of milling on cooking time of sorghum grain. *Cereal. Chem.* 57(6); 1980; 386-7

Three cultivars of hybrid sorghum grain of the hetero-yellow type were milled in an abrasive mill for varying lengths of time to remove different amounts of the outer layer of grain. The intact grain from each milling time was cooked to a soft, edible stage in water at 98 C. For all cultivars, cooking times decreased as the outer layers were removed, with the greatest decrease from removal of the first 10% of the grain. When about 20% of the grain has been removed, constant cooking times were attained for all cultivars. The minimum cooking times (46-49 minutes) were substantially longer than that of rice (about 25 minutes). AA

1866 KALUZA (WZ), McGRATH (RM), ROBERTS (TC) and SCHRODER (HH). Separation of phenolics of *Sorghum bicolor* (L). Monech grain. *J. Agric. Food Chem.* 28(6); 1980; 1191-6

1867 SUBRAMANIAN (V), JAMBUNATHAN (R) and SURYAPRAKASH (S). Note on the soluble sugars of sorghum. *Cereal. Chem.* 57(6); 1980; 440-1

## MAIZE

1868 BOYER (CD), DAMEWOOD (PA) and SIMPSON (EKG). The possible relationship of starch and phytoglycogen in sweet corn. I. Characteristics of particulate and soluble polysaccharides. *Starch.* 33(4); 1981; 125-30

The properties of starch and phytoglycogen fractions, isolated simultaneously from normal and sugary (*su*) maize have been studied, with a view to finding out whether phytoglucogen is formed from amylopectin. Normal starch had less than 1% of phytoglucogen and about 25-30% amylose. Extraction of *su* endosperm by two methods resulted in different distributions of starch and phytoglucogen. It was shown that phytoglucogen was distributed in a soluble fraction, and in a particulate fraction which also contained some amylose. A pattern of conversion of starch (granules) into phytoglucogen appears to be discernible in *su* endosperm. KMD

1869 LANDRY (J) and MOUREAUX (T). Distribution of amino acid composition of protein groups located in different histological parts of maize grain. *J. Agric. Food Chem.* 28(6); 1980; 1186-91

1870 MELCHER (U) and FRAIJ (B). Methionine-rich protein fraction prepared by Cryoprecipitation from extracts of corn meal. *J. Agric. Food Chem.* 28(6); 1980; 1334-6

## PULSES

1871 VOSE (JR). Production and functionality of starches and protein isolates from legume seeds (Field peas and horsebeans). *Cereal. Chem.* 57(6); 1980; 406-10

Technologies suited for commercial production of both protein isolates (about 90% protein) and refined starch were developed. Wet-processing technologies were adapted to produce the initial ground legume slurry from which starch and fiber were removed by centrifugation. Starch was further purified using a series of liquid cyclones incorporating a countercurrent wash. Legume starches containing <0.07% N were obtained in >95% yield; they contained 32-35% amylose and, in a Brabender viscoamylogram, had restricted swelling characteristics typical of type C starches. Gels were rigid, opaque, and friable with a firmer texture than that of comparable corn gels; weeping losses through syneresis (13-15%) were prevented by acetylation (0.1 degree of substitution). Aqueous extraction of the legume seeds yielded approximately 94% recovery of total seed nitrogen: of this, 82% was recovered as an isoelectric-precipitated fraction (at pH 4.4) for an overall 77% recovery. An alternative protein purification process was also developed using ultrafiltration technologies. With these systems, an approximate overall 82% recovery of seed nitrogen (in the isolate form) was achieved. The protein isolates prepared by either isoelectric precipitation or ultrafiltration were spray-dried and their functional properties were compared in terms of nitrogen solubility, foaming properties, water retention, colour, flavour and emulsification characteristics. AA

1872 MORAD (MM), LEUNG (HK), HSU (DL) and FINNEY (PL). Effect of germination on physicochemical and bread-baking properties of yellow pea, lentil and faba bean flours and starches. *Cereal. Chem.* 57(6); 1980; 390-6

The physicochemical properties of flours and starches from ungerminated and germinated yellow pea, lentil and faba bean were investigated. The α-amylase activity of the legume flours increased about 8.1 times for yellow peas, 2.4 times for lentils, and 1.5 times for faba beans after four days of germination. Scanning electron microscopy indicated some alteration of starch granule surfaces after germination. Germination caused changes in starch pasting properties of the legume flours and their starch fractions. Replacing wheat flour by legume starches affected loaf volume, crumb grain and crust colour of the breads. Germination appeared to have more derimental effects of the baking properties of yellow pea starches than on those of lentil and faba bean starches. AA

### *BROAD BEAN*

1873 VENKATESH (KVL) and SHURPALEKAR (SR). Effect of atmospheric humidity on drying on papads. *J. Food Sci. Technol. (India).* 18(2); 1981; 66-7

Blackgram (*Phaseolus mungo*) papads were dried in open at 38-82% of RH and 24-25 C and also in a cabinet drier at 64-66% RH and 31 C for 6 hours. Over drying was found at 38-43% RH within 4 hours drying at 78-82% RH for 6 hours incomple-

tely dried the product. Drying for 6 hours at 66-70% RH at 25 C in open air g a pliable product with desirable moisture content of 14.5%. Drying in a cabine drier at 64-66% RH and 31 C for 5 hours also gave a pliable product with optimu moisture content. KAR

*HARICOT BEAN*

1874 MONTE (WC) and MAGA (JA). Extraction and isolation of soluble and insoluble fiber fractions from the pinto bean (*Phaseolus vulgaris*). *J. Agric. Food Chem.* 28(6); 1980; 1169-74

1875 SHINDE (SC) and SHIRALKAR (ND). Effect of some chemicals on the cookability of Rajmah (*Phaseolus vulgaris*). *Indian Food Packer.* 34(6); 1980; 23-5

The dry beans of Rajmah are consumed like cowpea and gram after cooking and mixing with salt and condiments. (i) Ammonium chloride, (ii) Sodium acetate, (iii) Ammonium phosphate, (iv) Sodium dihydrogen phosphate, (v) EDTA, (vi) Sodium bicarbonate, (vii) Sodium chloride, (viii) EDTA + Sodium bicarbonate were used at 0.5% wt/vol. to reduce the cooking time. Of these chemicals, only (vi) and (v) alone or in combination reduced the cooking time from 10 minutes to 3 minutes. BSN

*YAM BEAN*

1876 WILLIAMS (AK). Caustic peeling of jicama. *Food Sci + Technol.* 12(4); 1979; 243-4

The jicama or yam bean (*Pachyrhizus erosus* (L) Urb.), is a leguminous plant long cultivated in Mexico and Central America for its large edible root, which has a "raw peanut" flavour and a crisp texture reminiscentof the Chinese waterchestnut (*Eleocharis dulcis*). Jicama roots can be successfully peeled by treatment with 14-18% NaOH (lye) solution at temperatures of 200-210 F. The discoloured roots may then be bleached with $H_2O_2$ to produce a white, commercially acceptable product. KMD

## OILSEEDS AND NUTS

1877 STAHL (G), SCHUTZ (E) and MANGOLD (HK). Extraction of seed oils with liquid and supercritical carbon dioxide. *J. Agric. Food Chem.* 28(6); 1980; 1153-7

From crushed vegetable oil seeds like, soybean, sunflower seed, rape seed, oil may be extracted by liquid or supercritical $CO_2$. Depending on pressure and temperature during extraction and size and shape of seed variation in yields were observed. By employing various pressures and temperatures, oil fractions possessing difference in colour, taste and odour may be obtained. The various parameters influencing the extraction and fractionation of soybean, sunflower and rapeseed oils are described. BSN

1878 KHAN (MN) and LAWHON (JT). Baking properties of oilseed protein and ioslates produced with industrial membrane systems. *Cereal. Chem.* 57(6); 1980; 433-6

Blends of wheat flour and protein isolates prepared from soy, cottonseed, and peanut flours by an alkaline extraction and ultrafiltration process were used to make bread by a short-time dough, white pan bread formula. Bread with acceptable volume was obtained when 4% soy or 8% cottonseed or peanut isolate was included in the formula. The protein isolate obtained by $Ca(OH)_2$ extraction of untoasted defatted soy or peanut flour produced better bread with higher

loaf volume than did the other six isolates. No significant difference was found in the baking properties of breads made from the two cottonseed isolates, Breads containing the soy protein isolates had superior crumb properties to the ones made from the peanut or cottonseed isolates. AA

## GROUNDNUT

79 BHUCHAR (VM), AGARAWAL (AK) and SHARMA (SK). A bromine titrational method for on-line control of solvent extraction of whole groundnut kernels. *Indian J. Technol.* 19(1); 1981; 38-40

The oil concentration in hexane solutions can be determined accurately by titration with bromine solution for on-line control of oil extraction from whole groundnut kernels. The method is most useful at oil concentration <2%. Refractive index determination serves for higher concentration up to 3%. The method is equally useful for olive oil solutions. AA

## RAPESEED

880 BOCK (H-D), KOZLOWSKA (H), MIETH (G), OHFF (R) and SCHADEREIT (R). Investigations on the improvement of the nutritive value of rapeseed meal, using production processing principles. *Nahrung.* 23(8); 1979; 829-41

With regard to studies on production process variants designed to improve the nutritive value of rapeseed meal, the authors describe the principles underlying the modified diffusion extraction procedures used (with and without rapeseed husking). Furthermore, they briefly outline the chemical methods applied to the determination of the nutrient composition and glucosinolate content of rapeseed meal variants as well as the methodology of their feeding and nitrogen balance experiments on growing albino rats and broilers. The results obtained with 13 analytical variants and 8 biological variants confirm once more the beneficial nutritive effects obtained with the reduction of the glucosinolate content of rapeseed meal in monogastric animal species. However, these results do not permit to appraise unequivocally the repercussion of rapeseed husking on the diminution of the content of paraplastic substances in rapeseed meal. The diffusion techniques used for reducing the glucosinolate content in rapeseed meal have been found to be effective. AA

## SOYBEAN

1881 JOHNSON (LA), DEYOE (CW), HOOVER (WJ) and SCHWENKE (JR). Inactivation of trypsin inhibitors in aqueous soybean extracts by direct steam infusion. *Cereal. Chem.* 57(6); 1980; 376-9

A means of direct steam-infusion cooking of aqueous soybean extracts for milk analogs was developed. The effect on trypsin inhibitor (TI) activity of heat in continuous processing was quantified over the temperature range 99-154 C. As process temperature increased each 11 C at pH 6.7, the rate of TI inactivation doubled. At 154 C, pH 6.7.40 sec of heat treatment produced TI inactivation equivalent to that in 60 min at 99 C (7.6% residual TI activity). Increasing the pH of the slurry to 9.5 substantially increased the rate of TI inactivation. Inactivation of TI activity by high-temperature, short-time processing exhibited reaction kinetics similar to the summation of two first-order reactions with different heat stabilities. We speculate that the heat-labile inhibition stemmed from the Kunitz inhibitor and the more heat-stable inhibition, from the Bowman-Birk inhibitor. AA

1882 MUFFETT (DJ) and SNYDER (HE). Measurement of unfrozen and free water in soy proteins by differential scanning calorimetry. *J. Agric. Food Chem.* 28(6); 1980; 1303-5

1883 OCHI (H) and BLENFORD (DE). The soy sauce explosion. *Food Process. Ind.* 49(585); 1980; 25,27,29

Discusses : raw materials; preparation; powder form; manufacture of powder; applications of powder and soups and noodles. BSN

*LITCHI*

1884 CHAKRABORTY (S), SAHA (NK), KAMAL PRAKASH and BISHT (HC). Studies on varietal suitability of litchi (*L.chinensis*) for canning. *Indian Food Packer.* 34(6); 1980; 17-22

Seven varieties of Litchi ((i) Sahi (ii) China (iii) Rose scented (iv) Early large red (v) Kalkatia (vi) Early seedless (vii) Khatti) were screened for their suitability for canning under different treatments with sugar syrup + 0.10% citric acid; with sugar syrup + 0.5% citric acid + 100 mg ascorbic acid/100 g syrup; sugar syrup of 0.10% citric acid + 100 mg ascorbic acid/100 g syrup; sugar syrup + 0.05% citric acid). Data are tabulated on the physical characteristics, chemical constituents, cut out analysis after 15 days and 12 months storage at 25-32 C and organoleptic evaluation scores of canned litchis. Varieties Early large red, Early seedless, Rose scented and Sahi were found suitable for canning. Addition of ascorbic acid to sugar syrup did not confer any beneficial effect on colour retention in litchis Slight to heavy discolouration was observed in all the varieties of canned litchi when stored for 1 year at 37 C. BSN

## TUBERS AND VEGETABLES

1885 MOHAN (M) and SRIVASTAVA (GP). Studies on the extractability and chemical composition of leaf proteins from certain trees. *J. Food Sci. Technol. (India).* 18(2); 1981; 48-50

Leaf protein concentrate (LPC) was extracted from leaves of six trees ((i) *Cassia fistula*, (ii) *Sesbania grandiflora*, (iii) *Gliricidia maculata*, (iv) *Morus alba*, (v) *Moringa oliefera* and (vi) *Leucaena leucocephala*) and the chemical composition determined. The protein extractability (%) ranged from 17.9 to 45.9: maximum was with (i) and (ii). The protein content (%) of LPC was 41.13 in (i), 42.88 in (ii), 43.75 in (iii), 40.25 in (iv), 33.69 in (v) and 31.50 in (vi). The range in values for etherextract was 6.55 for (iv) to 15.07 for (iii) ash content was 3.42 for (vi) to 15.46 for (iv) and carbohydrates 37.37 for (ii) to 49.89 for (v). KAR

1886 PRUTHI (JS), SAXENA (AK) and MANAN (JK). Studies on the determination of optimum conditions of preservation of fresh vegetables in acidified sulphited brine for subsequent use in Indian style curries, etc. *Indian Food Packer.* 34(6); 1980; 9-16

Optimum conditions for preservation were studied at room temperature for eight vegetables (ii) bitter gourd, (ii) cabbage, (iii) carrot, (iv) cauliflower. (v) okra (lady's finger, (vi) peas, (vii) squash melon and (viii) turnip) in acidified (citric or acetic acid) sulphited (KMS) brine and packed in glass jars or glazed jars or friction top tins with an inside lining of polyethylene. Data on physico-chemical composition (moisture, total ash, ether extract, red sugars, total sugars protein, crude fibre, vitamin C) changes in physico-chemical

characteristics of preserved vegetables stored for six months; microbial load effect of leaching on chemical composition of preserved vegetables and standardization of optimum conditions for steeping preservation are given. The optimum storage period for (iii), (iv) and (viii) was 9 months, while for (i), (ii), (v), (vi) and (vii) it was 6 months. Optimum time for leaching brined vegetable in running tap water was 2 hour for (i), (ii), (iii), (iv), (v) and (vii) and 2.5 hour for (vi) and (viii). Indian style curries and paloras prepared from leached vegetables were judged satisfactory and acceptable, except in flavour which was some what less intense as compared to fresh vegetables. BSN

## ONION

887 CORIN (N) and HEIDEMA (FT). Clean upof methanolic extract in high-pressure liquid chromatography of fructose, glucose and sucrose in onion powder. *J. Agric. Food Chem.* 28(6); 1980; 1340-2

A mini column of aluminium oxide could be used to clean up onion extract in 80% buffered methanol, without this step, the injector and analytical column of the high-pressure liquid chromatograph (LC) became seriously damaged after many injections. Buffered methanol, pH 6.6, prepared with acetate buffer instead of phosphate was suitable for extraction and injection of soluble sugars from onion powder. Phosphate salts in methanol form needless that are dangerous for the analytical column of the high pressure LC. AA

## RADISH

888 KURECHI (T), KIKUGAWA (K) and FUKUDA (S). Nitrite-reacting substances in Japanese radish juiceand their inhibition of nitrosamine formation. *J. Agric. Food Chem.* 28(6); 1980; 1265-9

## POTATO

889 NEWSOME (WH). Residues of maleic hydrazide in field-treated potatoes. *J. Agric. Food Chem.* 28(6); 1980; 1312-3

## ALFALFA

890 HANNA (MA) and OGDEN (RL). Expression of alfalfa juice. *J. Agric. Food Chem.* 28(6); 1980; 1212-6

A double-roll laboratory scale press (3 kg/h) aided expressionof juice from alfalfa or other vegetation. Maceration before pressing improved expression of juice. Addition of water to forage before expression of juice was not conclusively proved advantageous. BSN

## TOMATO

1891 SIMONEAUX (BJ), MARTIN (G), CASSIDY (JE) and RYSKIEWICH (DP). Isolation and identification of the major polar metabolites of methidathion in tomatoes. *J. Agric. Food Chem.* 28(6); 1980; 1221-4

OKRA

1892 SAVELLO (PA), MARTIN (FW) and HILL (JM). Nutritional composition of okra-seed meal. *J. Agric. Food Chem.* 28(6); 1980; 1163-6

Okra seed (*Abelmoschus esculenta* Moench) showed the following chemical composition: protein 21%, lipids 14%, ash 5%, while seed meal had 33% protein, 26% lipids and 6% ash. Chemical score of okra seed is 55 and isoleucine is its first limiting amino acid. The seed oil (saturated/unsaturated fatty acid) ratio was 1:1.55) contained linoleic, 42%, palmitic 34% and oleic acid 18%. Whole seeds showed 135 mg of Ca/100 g and 335 mg/µg/100 g while Cu, Fe, Mn and Zn were present in lesser amounts ( <5 mg/100g). Removal of hulls upgraded iron content to 11 mg/100 g of Zn to 1 µmg/100 g and of magnesium to 518 mg/100 g. BSN

BREAD FRUIT

1893 COX (PA). Two samoan technologies for bread fruit and banana preservation. *Econ. Bot.* 34(2); 1980; 181-5

Manufacture of *masi* a bread like substance prepared from fermented bread fruit or bananas is described. The preparation can be preserved for nearly an year in pit. KAR

## FRUITS

1894 HALL (NT), SMOOT (JM), KNIGHT (RJ) Jr. and NAGY (S). Protein and amino acid compositions of ten tropical fruits by gas-liquid chromatography. *J. Agric. Food Chem.* 28(6); 1980; 1217-21

Data on protein and amino acid composition of ten tropical fruits (Sapote, *Pouteria Sapota* H.E. Moore and Stearn; longan, *Euphoria longan* Lour; persimmon, *Diospyros sonorae*, Standl; mango *Mangifera indica*. L.; Cattley guava, *Psidium littorale* Raddi; saprodilla *Manilkara zapota* L., Carambola, *Averrhoa Carambola* L., Loquat, *Eriobotrya Japonica* have been reported and discussed. The crude protein content ranged from 0.4-2.7 g/100 g edible fruit pulp. In all the fruits examined, aspartic acid and glutamic acid were present in large amounts where as in some fruits alanine, glycine, serine, hydroxyproline and proline were found in larger amounts. BSN

1895 SCHLIESSMANN (C). The early epoch of the non-alcoholic utilization of fruits. *Flussiges Obst.* 46(12); 1979; 468-70 (German)

1896 TAFURI (F), MARUCCHINI (C), PATUMI (M) and BUSINELLI (M). Determination of thiabendazole residues in fruits by high-performance liquid chromatography and their confirmation after p-Nitrobenzyl derivative formation. *J. Agric. Food Chem.* 28(6); 1980; 1150-3

HPLC with a UV detector when used for thiabendazole (TBZ) residues requires prior elimination of interfering substances by a combined partitioning scheme and silica gel column chromatography. Quantitative results are obtained when TBZ is converted to p-nitrobenzyl derivative. Recoveries from fortified fruits ranged between 78.6 and 103.2% in the range of 0.02-1.0 mg/kg. The limit of detections are 0.002 mg/kg for pears and bananas and 0.02 mg/kg for oranges. BSN

## DATE

1897 JADDOU (H) and AL-HAKIM (M). Gas-liquid chromatography of trimethylsilyl derivatives of sugars from Iraqi dates. *J. Agric. Food Chem.* 28(6); 1980; 1208-12

The method for accurate measurement of sugars in Iraqi dates, involves the use of 95% ethanol for Soxhlet extraction, conversion of sugars to their trimethylsilyl ($Me_3Si$) ether derivatives before GLC estimation. The internal standa employed was arabinose and separation was carried out on a 3% SE-30 column Major sugars found in dates were fructose, α and β-glucose and sucrose. Sorbitol and sorbose were present in only small amounts. BSN

## PINEAPPLE

1898 DAS THAKUR (SP), CHAUDHURI (DR) and BOSE (AN). Quality control aspect of processed pineapple products. *Indian Food Packer.* 34(6); 1980; 3-8

Canned pineapple products ((i) slices, (ii) titbits, (iii) juice) from different processors in the Eastern region (India) were assessed for their physico-chemical (vacuum, head space, acidity, TSS, drained weight, drained weight/net weight, filled volume, lead, tin, iron, sulphited sulphur, ash) and microbiological characteristics with reference to Fruit Products Order (India) Standards. A tentative calculation was attempted for losses occuring due to excess weight over the declared weight of pineapple slices and losses of sugar in the filled liquor. As processors normally pack 475-480 g slices in cans when only desired drained weight of 425 g is required in A 2½ cans, this kind of loss occurs. The national losses in terms of slices and sugars during the year 1975-77 has been worked out to be 197.81 ton valued at about 0.7 million Rs. The need for uniform maturity of slices has been stressed. The use of pineapple core extract with the fruit juice lowers the quality of the final product and should, be avoided. 10.5% of the cans examined were found defective. Of them, 1.4% showed microbial growth (mostly gram negative and non spore forming rods). Of the microbiologically defective samples, the distribution among (i), (ii) and (iii) was 0.81, 0.53 and 0.07% respectively. The range of values in (i)-(iii) for presence of Pb, and Fe were 0.01-0.15 p.p.m. and 5.15-23.0 p.p.m. respectively. At the end of 12 month storage, Sn content ranged between 85-142 p.p.m. as compared to the initial values of 26.42 p.p.m. BSN

1899 MOORE (DJ) and CAYGILL (JC). Proteolytic activity of Malaysian pineapples. *Trop. Sci.* 21(2); 1979; 97-102

Fruit bromelain activity (EC 3.4.22.5) against casein was measured in various portions of the fruit of six cultivars of unripe, half-ripe and ripe Malaysian pineapples. Acidity, sugar content and juice yield were recorded. Fruit bromelain activity was highest in the fleshy fruit cylinder, slightly lower in the skin and ends and lowest in the core. The ripe fruit had approximately half the activity of the unripe fruit. AA

## CITRUS

1900 SHOMER (I), BEN-GERA (I) and BEN-SHALOM (N). Epicuticular wax and its hydrocarbons from inter-juice-sac spaces in citrus fruit segments. *J. Agric. Food Chem.* 28(6); 1980; 1158-63

### GRAPEFRUIT

1901 BUTTERY (RG), SEIFERT (RM), HADDON (WF) and LUNDIN (RE). 2-hexyl-3-methylmaleic anhydride: An unusual volatile component of raisins of almond hulls. *J. Agric. Food Chem.* 28(6); 1980; 1336-8

The volatile oils of California raisins and almond hulls, when subjected to GLC-MS, IR and H NMR spectrometric studies yielded 2-hexyl-3-methylmaleic anhydride. The presence for the first time of a probable natural volatile acid anhydride in a food has thus been recognized. BSN

1902 KING (JR), VON WINDEGUTH (DL) and BURDITT (AK) Jr. An electron capture gas chromatographic method for determination of residues of 1,2-dibromoethane in fumigated grapefruit. *J. Agric. Food Chem.* 28(6); 1980; 1049-52

The method involves steam distillation from a benzene-water mixture for separation and cleanup and use of GC equipped with a nickle-63 electron capture detector for determining EDB present in grapefruit samples. As low as 0.00038 mg/kg of EDB may be detected. BSN

### JACKFRUIT

1903 THOMAS (CA). Jackfruit, *Artocarpus heterophyllus* (Moraceae), as source of food and income. *Econ. Bot.* 34(2); 1980; 154-9

Origin and distribution, floral morphology, propagation and uses are the aspects covered. KAR

### PAPAYA

1904 PAL (DK), DIVAKAR (NG) and SUBRAMANYAM (MD). A note on the physico-chemical composition of papaya fruits ripened on and off the plant. *Indian Food Packer.* 34(6); 1980; 26-8

Physico-chemical characteristics of five varieties (Coorg honey dew, pink flesh sweet, Sunrise, Thailand and Washington) of (i) tree ripened and (ii) ripened at room temperature papaya (Carica papaya) fruits have been investigated. (i) took 8-10 days for ripening as against 3-5 days with (ii) when fruits of the same maturity stage were used. (i) had more of pulp/peel ratio, and the pulp contained more of DM, alcohol insoluble acids, total soluble acids, soluble amino acids, total sugars and glucose than pulp of (ii). Fructose content showed marginal increase or decrease depending on variety (i) contained more vitamin A than (ii), while vitamin C was almost same or slightly increased in (i) as than in (ii). BSN

## SUGAR, STARCH AND CONFECTIONERY

### SUGAR

1905 LINGNERT (H) and ERIKSSON (CE). Antioxidative maillard reaction products. I. Products from sugars and free amino acids. *J. Food Process. Preserv.* 4(3); 1980; 161-72

Maillard reaction products (MRP) obtained by reaction of glucose fructose or xylose with lysine, glutamic acid and valine and their antioxidative properties were studied. Emulgated linoleic acid was used in the model system. Antioxidant effect was found to be strongly dependent on the choice of reactants,

especially the amino acids. While MRP from glutamic acid with glucose or fructose showed no antioxidative properties. Reaction between histidine and glucose was studied with regard to the influence of pH and of the molar ratio of amino acid to sugar on the antioxidative effect of the MRP formed. Basic pH and high histidine concentration favours the production of antioxidative products. BSN

1906 DICESARE (JL). The analysis of carbohydrates on high efficiency columns using an aqueous mobile phase. *Chromatogr. Newslet.* 8(2); 1980; 52-6

1907 KIERSTAN (M). Production of fructose syrups from inulin. *Process Biochem.* 15(4); 1980; 2-4, 32

Discusses the processes involved and its limitations in production of high fructose syrup from inulin. BSN

1908 DONNELLY (BJ), VOIGT (JE) and SCALLET (BL). Reactions of Oligosaccharides. V. pyrolysis-gas chromatography. *Cereal. Chem.* 57(6); 1980; 388-90

Pyrolysis-gas chromatography (pyrolysis-GC) distinguished between model carbohydrate compounds, a series of malto-oligosaccharides previously isolated in our laboratories from corn syrup. These sugars, namely maltose ($G_2$), maltotriose ($G_3$), maltotetraose ($G_4$), maltopentaose ($G_5$), and maltohexaose ($G_6$), were subjected to pyrolysis-GC under carefully controlled conditions, major volatile compounds were identified by mass spectrometry. The oligosaccharides gave similar decomposition products. However, when the pyrograms were normalized, the relative amounts of individual volatile components varied from one sugar to the next. This proved to be true also for other disaccharides and trisaccharides examined by this technique. Differences in the normalized patterns permitted differentiation between carbohydrates of varying molecular structure. Major volatile compounds identified were ethylene, ethane, propylene, acetaldehyde, furan, propionaldehyde, acetone, 2-methylfuran and methyl ethyl ketone. AA

## *STARCH*

1909 ANON. Starch industry in India. *Sendok Bull.* 8(12); 1980; 30-6

1910 BLITTERSDORFF (W.Von) and BAHR (J). Importance of the EEC Agricultural Market Regulations for the starch industry. *Starch.* 33(4); 1981; 109-11 (German)

The effects of the recent proposals of the EEC Commission to reform the starch regulations have been briefly discussed and on the whole welcomed. But an objection has been raised to the step-motherly treatment of isoglucose in the EEC regulations. KMD

1911 KEARSLEY (MW) and NKETSIA-TABIRI (J). The enzymic hydrolysis of starch containing crops. *Food Sci + Technol.* 12(4); 1979; 199-202

Starch containing crops have been found to be suitable as starting materials for the production of glucose syrup, even without prior isolation of the starch. However, in the case of wheat and maize the protein component should be recovered as this is a valuable animal feed, which can affect the cost of starch/glucose syrup production. Potato, rice, and cassava have been found to be ideal substrates for this type of process. KMD

1912 SUGIMOTO (Y), YAMADA (K), SAKAMOTO (S) and FUWA (H). Some properties of normal and waxy-type starches of *Amaranthus hypochondriacus* L. *Starch.* 33(4); 1981; 112-6

Starch granules were prepared from seeds of two types of *Amaranthus hypochondriacus* L. which are native to Nepal. The perisperm of one type of seeds stained reddish-brown with iodine solution, and that of the other blue. The round-shaped starch granules had a diameter of about 1 μm. X-ray diffraction diagrams were very similar to each other and identical to the diagrams of rice and maize starches (A-type). Amylose content was about 14% and 0% respectively. Both types of *Amaranthus* starches had a typical amylopectin which was almost identical to those of rice and maize starches. Starch-granule digestibility by amylases and pasting characteristics of the *Amaranthus* starches were similar to those of fine starch granules. KMD

## BAKERY PRODUCTS

1913 MARCY (G) and ADAM (W). The problem of evaluating bacteriological findings on cream and custard holding pastry and confectionery. *Dtsch. Lebensmittel-Rundschau.* 76(7); 1980; 225-7 (German)

The bacteriological evaluation of cream and custard in pastry and confectionery products is difficult. A total of 232 pieces of cream cakes were examined for the bacterial counts. As per the results obtained bacterial counts upto the following limits seem to be acceptable: total count < $5 \times 10^5$ organisms/g; coliform count $\leq 10^3$ organisms/g; E.coli $\leq 10$ organisms/g and yeasts $\leq 10^4$ organisms/g. On the other hand, the presence of *Staphylococcus aureus*, *Pseudomonas aeruginosa*, bacteria of the *proteus* group and moulds even in small numbers, should always be regarded as sufficient ground for serious criticism. The importance of adequate refrigeration prior to sale is emphasized. KMD

### *BREAD*

1914 PALAMIDIS (N) and MARKAKIS (P). Effect of baking and toasting on the protein quality and lysine availability of bread. *J. Food Process. Preserv.* 4(3); 1980; 199-210

The protein efficiency ratio (PER) and net protein ratio (NPR), the protein digestibility *in vivo* (in rats) and *in vitro* (multienzyme digestion), and the lysine availability *in vivo* (in rats) and *in vitro* (fluorodinitrobenzene method) of unbaked bread mix, bread, crust, crumb, and bread toasted at two levels of darkening were determined. Compared to an adjusted PER of 0.75 for the unbaked bread ingredients, the PER of the entire loaf was 0.46, but that of the crumb was 0.91, while the crust showed a negative PER, -0.23. The corresponding NPR's were 1.51, 1.22, 1.62 and 0.69. Light toasting reduced the PER of the bread to 0.40 (NPR 1.11) and dark toasting to 0.16 (NPR 0.95). The protein digestibility decreased as the bread ingredients were exposed to greater amounts of heat (baking, light and dark toasting), but the crumb protein of untoasted bread was slightly more digestible *in vivo* than the protein of the raw bread ingredients. The total lysine content also decreased with increasing exposure to heat, the crumb lysine content being an exception. The available lysine content, as measured by either the biological or the chemical methods, suffered significant decrease as the heat exposure increased, and correlated very highly with PER (available lysine *in vivo* vs PER, r = 0.988; available lysine *in vitro* vs PER, r - 0.979). AA

1915 BIRCH (REW) and FINNEY (PL). Note on fresh egg yolk in 50% whole wheat bread. *Cereal. Chem.* 57(6); 1980; 448-9

*BISCUIT*

1916 HOYLE (D), McFARLANE (I) and HOPE (V). Electronic developments and biscuit manufacture. *Food Trade Rev.* 50(8); 1980; 418-22

After briefly reviewing the developments in process technology, the author mentions about the trends in automatic sensing equipment, measurement of process variables, automatic feedback control, self checking instruments, and probe inspection. KAR

*COOKIE*

1917 CLEMENTS (RL). Note on the effect of removal of free flour lipids on the internal structure of cookies as observed by a resin-embedding method. *Cereal Chem.* 57(6); 1980; 445-6

1918 GAINES (CS) and TSEN (CC). A baking method to evaluate flour quality for rotary-molded cookies. *Cereal Chem.* 57(6); 1980; 429-33

A baking method to evaluate the quality of flour used in the production of rotary-molded (RM) cookies was developed. The ingredient formula and baking conditions were chosen to be similar to those used in commercial production of RM cookies. The RM method and the American Association of Cereal Chemists (AACC) official method were compared, using flours of varying quality. The RM and AACC methods evaluated flour quality differently. The AACC method evaluated flour quality on the basis of cookie width, and the RM method evaluated it using cookie thickness and density, which are important in the commercial packaging of RM cookies. AA

## MILK AND DAIRY PRODUCTS

1919 ANEJA (VP), ARORA (DR), KOHLI (RK) and RAWAL (SR). Water supply and treatment in dairy industries. *Indian Dairyman.* 33(3); 1981; 161-4

Various treatments to obtain soft, cold water free from all impurities as required by the dairy industry have been discussed. They include chlorination, sand filtration, activated carbon treatment, threshold treatment and water softening treatment. MVG

*MILK*

1920 BLACK (RG), PASCO (JR) and WELTON (RL). Effect of lighting conditions on determination of iodide in milk using a specific ion electrode. *Aust. J. Dairy Technol.* 35(2); 1980; 64-5

It is pointed out that the electrode should be shielded from light during the calibration procedure because although the opacity of milk shields the electrode from light the calibration is carried out in transparent standard solutions. KAR

1921 DALGLEISH (DG). Effect of milk concentration on the rennet coagulation time. *J. Dairy Res.* 47(2); 1980; 231-5

Measurements have been made of the coagulation times (CT) of concentrated and diluted milks when treated with chymosin. After dilution, milks showed a large increase in CT: conversely, concentrated milks showed a similar CT to unconcentrated milk. The results are discussed in terms of a mechanism which

reduces to a form similar to that proposed by Holter (1932). AA

1922 FOX (PF), NASH (BM), HORAN (TJ), O'BRIEN (J) and MORRISSEY (PA). Effect of selected amides on heat-induced changes in milk. *J. Dairy Res.* 47(2); 1980; 211-9

1923 DARLING (DF). Heat stability of milk. *J. Dairy Res.* 47(2); 1980; 199-210
The heat stability of a standard reconstituted skim-milk preparation has been investigated as a function of pH, temperature of coagulation and forewarming treatment. Apparent activation energies have been calculated from the temperature dependence of coagulation time and a constant value of 144 kJ/mole has been found for milks between pH 6.6 and 6.9. The effect of forewarming resulted in a decrease in stability at the most acid pH values, a slight increase at higher pH but below the pH maximum and a decrease in the region of the pH minimum. A working hypothesis is proposed for the mechanisms leading to the coagulation of milk at elevated temperatures, based upon Ca induced precipitation of casein, protein polymerization, β-lactoglobulin: K-casein interaction and precipitation of insoluble Ca phosphates. AA

1924 RANGARAJAN (R), DESAI (NV), DEVMURARI (CV), RAO (AV) and PAREKH (JV). Concentration of milk by ultrafiltration. *Indian J. Technol.* 19(2); 1981; 43-5
Laboratory scale experiments on concentration of whole milk and skim milk are reported. Cellulose acetate membranes were used in the ultrafiltration at 65 pounds per square inch gauge and were found to concentrate protein and fat from 3.6 - 4 times in skim milk and 3.1-3.2 times in whole milk. The recovery of fat and protein in skim and whole milk concentration process were found to be 100 and 92 % respectively. AA

1925 HUBBLE (IB) and MEIN (GA). Cleaning and sanitising milking machines with the acidified boiling water system. *Aust. J. Dairy Technol.* 35(2); 1980; 54-8

1926 KORHONEN (H). A new method for preserving raw milk- the lactoperoxidase anti-bacterial system. *World Anim.Rev.* No. 35; 1980; 23-9
It is known that $H_2O_2$ can be used to preserve milk but its use adversely affects the processing properties of milk. However, 8-9 ppm of $H_2O_2$ in combination with an equivalent concentration of thiocyanate ions ($SCN^-$) has a substantial anti-bacterial effect in raw milk but does not affect its further processing. The ($SCN^-$) is converted to hypothiocyanate ($OSCN^-$) which is very probably the anti-bacterial compound. The conversion of ($SCN^-$) to ($OSCN^-$) is catalysed by lactoperoxidase (LP), which is abundantly present in cow's milk. The LP/$H_2O$/($SCN^-$) system may be greatly advantageous in preserving raw milk in tropical countries under ambient conditions. It can also extend the storage life of cooled milk. KMD

1927 DOWNEY (WK). Review of the progress of dairy science: Flavour impairment from pre- and post-manufacture lipolysis in milk and dairy products. *J. Dairy Res.* 47(2); 1980; 237-52
Discusses : extent of lipolysis; lipolysis i milk; causes of spontaneous and induced lipolysis and lipolysis in dairy prodcuts. BSN

1928 OZIMEK (G), POZNANSKI (ST) and SMIETANA (ZO. Rheological properties of texturized milk protein. *Nahrung.* 23(8); 1979; 813-9
The most important rheological properties of institute-produced textured milk protein were analyzed and compared with the rheological properties of beef. It was found that the before-mentioned products are of similar texture. AA

1929 JOGLEKAR (S) and GUPTA (SK). Effect of heat processing on the flavour of milk and milk products. *Indian Dairyman.* 33(3); 1981; 143-7

Effects of heat treatment of flavour volatiles (S and non S compounds) in milk, various flavours (astringent, cabbagy, cooked, oxidised and rancid) of milk and the flavour of various dairy products (butter and cream, cheese, dried milk, evaporated milk, ice cream, and butterfat or ghee) have been discussed. MVG

1930 YAGIL (R) and ETZION (Z). Effect of drought condition on the quality of camel milk. *J. Dairy Res.* 47(2); 1980; 159-66

*WHEY*

1931 TUOHY (JJ). Physical properties of textured whey protein. 1. Texture. *Irish J. Food Sci. Technol.* 4(1); 1980; 35-44

Textured whey protein was produced by irradiating whey protein concentrate in aqueous solution (termed a dope) with microwaves at a frequency of 2,450 mc. Texture was evaluated by the Minnesota Texture Method (M.T.M.). Three texture parameters: (i) maximum compression-shear-extrusion force, (ii) the energy required for compression-shear-extrusion and (iii) the slope of the compression force v displacement line, were used to measure the effect of texture of independently altering the pH, protein/dry matter content and the casein/total protein ratio of the dope. Minimum texture values were found at pH 5 and maximum at pH 7-9. An increase in the protein/dry matter content of the dope from 45-65% increased the maximum force from 62 kg to 243 kg. When casein replaced 50% of the whey protein the maximum force fell from 168 to 51 kg. Similar changes were found in the other two texture parameters. AA

*CHHANA*

1932 GYANENDRA KUMAR. Innovations in the packaging of chhana. *Indian Dairyman.* 33(3); 1981; 153-6

After discussing briefly the functions of a package the author deals with the effect of packages on keeping quality; criteria for selection of packaging material; properties of packaging materials for chhana; appropriate packages; and evaluation of packaged product. MVG

*CHEESE*

1933 MERIN (UZI) and CHERYAN (M). Factors affecting the mechanism of flux decline during ultrafiltration of cottage cheese whey. *J. Food Process. Preserv.* 4(3); 1980; 183-98

1934 MULVIHILL (DM) and FOX (PF). Proteolysis of $\alpha_{s1}$-casein by chymosin in dilute NaCl solutions and in cheddar cheese. *Irish J. Food Sci. Technol.* 4(1); 1980; 13-23

The proteolytic activity and specificity of chymosin on $\alpha_{s1}$-casein was influenced by NaCl but the effect depended on the reaction pH. Increasing the NaCl concentration from 0 to 20% (w/v) reduced proteolytic activity at pH 5.8, while at a constant salt level (5%, w/v) inhibition was greatest at higher and

lower pH values but hydrolysis of the primary susceptible bond of $\alpha_{s1}$-casein was slightly stimulated at pH 5.2. A polypeptide $\alpha_{s1}$-VII was formed at pH 5.8 only in the presence of 5% NaCl. At pH 5.2 $\alpha_{s1}$-I was hydrolysed to $\alpha_{s1}$-V in a salt-free system but was hydrolysed instead to $\alpha_{s1}$-VII and $\alpha_{s1}$-VIII in the presence of 5% NaCl. A comparison of Cheddar cheese fractions obtained by gel filtration on Sephadex G-150 with $\alpha_{s1}$-casein hydrolysates showed that cheese contained high levels of peptides corresponding in electrophoretic mobilities and molecular weights to $\alpha_{s1}$-I, $\alpha_{s1}$-V, $\alpha_{s1}$-VII and $\alpha_{s1}$-VIII and only trace amounts of $\alpha_{s1}$-II. AA

*GHEE*

1935 SHARMA (RS). Ghee : A resume of recent researches. *J. Food Sci. Technol. (India* 18(2); 1981; 70-7

The various aspects covered in the review are: chemical composition of ghee including saponifiable and unsaponifiable constituents; flavour components; physico-chemical properties; thermal oxidation effect on saponifiable and unsaponifiable constituents, physico-chemical constants and carbonyl compounds and flavour; keeping quality of ghee influenced by feeding, season, method of preparation and packaging material, moisture, trace elements, amino acids, phospholipids, synthetic antioxidants, betel and curry leaves; improvements made in analytical/test methods; advances made in ghee making techniques and the future line of work needed. KAR

1936 SHRI HARI RAO (K). Packaging of ghee. *Indian Dairyman.* 33(3); 1981; 149-52

Various factors in selection of packing material for ghee (butterfat), and the advantages and disadvantages of rigid containers (glass, tin), and flexible materials (papers, cellulose films, and plastics) have been covered. MVG

## MEAT AND POULTRY

1937 IKEUCHI (Y), ITO (T) and FUKAZAWA (T). Change in the properties of myofibrillar proteins during post-mortem storage of muscle at high temperature. *J. Agric. Food Chem.* 28(6); 1980; 1197-202

1938 DAGERSKOG (M). Pan frying of meat patties. 1. A study of heat and mass transfer. *Food Sci + Technol.* 12(4); 1979; 217-24

A quantitative model of heat and mass transfer during double-sided contact frying has been proposed based on experimental measurements of the distribution of temperature, water and fat in meat patties of three different recipes as a function of frying time. Separate measurements of water retaining capacity were used to calculate drip losses, as a function of meat temperature. A faster temperature response was found during free water migration, in comparion with prevented migration. The influence of product thickness and heat transfer coefficient on centre temperature lapse and water losses was studied by using the computer program. KMD

1939 DAGERSKOG (M). Pan frying of meat patties. II. Influence of processing conditions on heat transfer, crust color formation, cooking los s and sensory quality. *Food Sci + Technol.* 12(4); 1979; 225-30

Meat patties were fried in a double-sided contact fryer at 140, 160 and 180 C pan temperature and constant contact pressure from initial temperatures of -20 and +10 C. Using a modified mathematical model of the frying process,

it was possible to simulate with a computer the results, actually determined by experiments relating to temperature lapses crust colour and water losses, as functions of frying time. The temperature response was faster, and the water losses higher, when the meat patties were coated with fat before frying, than when they were not so coated. Sensory analysis, after frying to 75 C showed increasing acceptance of appearance, texture and flavour as the pan temperature increased. KMD

## BEEF

1940 DEMPSTER (JF). Effect of a temperature malfunction in a deep-freeze cabinet, set at -18 C on a strain of *Staphylococcus aureus* (NCDO 771) in beef mince. *Irish J. Food Sci. Technol.* 4(1); 1980; 25-34

Beef mince in 250 g lots was inoculated with a toxigenic strain of *Staphylococcus aureus* (NCDO 771), vacuum packed in nylon/polythene film and stored in a freezer for 40 days (test samples). At intervals, the freezer was switched off for 24 hour and survivors of *Staph. aureus* determined. Total viable numbers (25 and 4 C) were also determined. Results indicated that *Staphylococcus aureus* lost little viability in mince when stored at -18 C for 6 weeks. Coagulase-positive *staphylococci* were not recovered in control samples, initially or after storage. The initial total count (25 C) of the mince was log 3.5/g. Initial counts (25 and 4 C) differed from each other by only log 0.22/g, indicating the psychrophilic nature of the flora. Defrosting at 5 C resulted in total numbers of between 2 and 4 log cycles per g lower than defrosting at 10 or 22C. AA

1941 MORRISSEY (PA), BUCKLEY (DJ) and DALY (MC). Effect of four species of bacteria on minced beef stored at 7 C. *Irish J. Food Sci. Technol.* 4(1); 1980; 1-11

Aseptically procured samples of minced beef were inoculated with the following bacteria isolated from spoiled beef: a non-pigmented *Pseudomonas*, *Pseudomonas fluorescens*, *Aerobacter aerogenes* and a *Micrococcus* species. Using various chemical and bacteriological methods for assessment, the inoculated samples were compared with sterile controls during storage at 7 C. The pH of all inoculated samples increased with microbial counts although marked species differences were evident. The two *Pseudomonas* organisms produced significant extracellular proteolytic activity when the counts reached $10^8$/g. In comparison with controls, samples inoculated with the two *Pseudomonas* and the *Aerobacter* species increased in total volatile nitrogen (TVN) only during the latter part of storage, after off-odours had developed. TVN values for the sample inoculated with the *Micrococcus* species remained relatively low during the study periods. In general, increases in tyrosine values occurred in both sterile and inoculated samples during storage. AA

1942 McKEITH (FK), SMITH (GC), SAVELL JW), DUTSON (TR), CARPENTER (ZL) and HAMMONS (DR). Electrical stimulation of mature cow carcasses. *J. Anim. Sci.* 50(4); 1980; 694-8

1943 VAN DE RIET (SJ) and HARD (MM). Flavor quality of antioxidant-treated, cooked, ground beef patties. *J. Am. Diet. Assoc.* 75(5); 1979; 556-9

The effect of tertiary-butyl hydroquinone (TBHQ) on flavour changes in cooked ground beef patties has been studied. Organoleptic studies and chemical scores have shown that TBHQ retards flavour deterioration and oxidative rancidity. BSN

1944 ROSS COCKRILL (W). The ascendant water buffalo: key domestic animal. *World Anim. Rev.* No.33; 1980; 2-13

World buffalo stocks, amounting to 150 million in about 40 countries, are increasing steadily. There are 19 distinct breeds. The meat of buffaloes that are reared and fed for early slaughter is of excellent quality. It is also cheaper to produce as the buffalo is a superb converter and does not need expensive fodders and concentrates. There is growing interest in the establishment of buffalo herds in countries where the buffalo is a newcomer. KMD

*SHEEP*

1945 MASON (IL). Sheep and goat production in the drought polygon of Northeast Brazil. *World Anim. Rev.* No.34; 1980; 23-8

1946 DEGEN (AA) and YOUNG (BA). Effect of cold exposure on liveweight and body fluid compartments in sheep. *Can. J. Anim. Sci.* 60(1); 1980; 33-41

*PORK*

1947 BRANNON (RH), SIRIRUGSA (C) and DEAN (BT). Testing of research station results at the farm level : Lessons from a pig feeding trial in Northeast Thailand. *Trop Sci.* 21(2); 1979; 75-84

The suitability of a pig ration developed at a research station in N.E. Thailand, for possible use by small-scale pig producers, has been subjected to a farm-level economic analysis. It was found that, if all costs were included, pig production was in most cases, not a porfitable enterprise with either traditional or test rations. Though the average feed conversion ratio attained at the research station was 3.11, the conversion ratio at the farm level worked out to 5.59 on an average. The traditional ration was more economical than the test ration, if the performance of the entire group of co-operating farmers was computed. But the better farmers did get better results with the test ration. KMD

*HOG*

1948 BHARUCHA (KR), CROSS (CK) and RUBIN (LJ). Long chain acetals of ascorbic acid and erythorbic acids as antinitrosamine agents for bacon. *J. Agric. Food Chem.* 28(6); 1980; 1274-81

Long chain acetals of ascorbic and erythorbic acids (so far not known) act as excellent blocking agents for nitrosamine reaction in bacon. Acetals remain potent in bacon even after 35 days at +3 C. BSN

1949 OWENS (JL) and KINAST (OE). An improved procedure for the determination of volatile N-nitrosamines in bacon grease by using the mineral oil distillation-thermal energy analyzer method. *J. Agric. Food Chem.* 28(6); 1980; 1262-4

The improved method which is fast, selective and realiable enables detection of N-nitrosamine in rendered bacon grease at ppb levels. N-nitrosamine recoveries improve when a distillation aid consisting of silica gel and kaotin are used for the mineral oil distillation procedure. With a GC coupled with thermal energy analyzer detector, N-nitrosamines are analysed. BSN

## SWINE

1950 MARTIN (AH), SATHER (AP), FREDEEN (HT) and JOLLY (RW). Alternative market weights for swine. II. Carcass composition and meat quality. *J.Anim.Sci.* 50(4); 1980; 699-705

## RABBIT

1951 CAVENY (DD) and ENOS (HL). The location of literature on rabbit research. *World Anim. Rev.* No. 34; 1980; 43-4

## POULTRY

1952 BIELY (J), KITTS (WD) and BULLEY (NR). Dried poultry waste as a feed ingredient. *World Anim.Rev.* No.34; 1980; 35-42

1953 ICHHPONANI (JS) and GULIA (JS). Present and future feeding of poultry in India. *Poult. Guide.* 18(3); 1981; 21-2

Poultry diets in India contain at present 30-40% of cereals, mainly maize. As the human populations demand for cereal increases, future poultry diets are likely to be based on deoiled bran and meals, tallow, synthetic sugar, single-cell protein and synthetic aminoacids. An example of such a diet has been given. KMD

1954 BARUAH (KK), SAIKIA (A) and PATHAK (NW). Soyabean and pea as a sole source of protein in layer ration. *Poult. Guide.* 18(3); 1981; 75-6

Climatic factors do not reduce the content of trypsin inhibitor in soya bean so that it is inadvisable to have large quantities of soya bean in layer rations. At lower levels, however, and especially in combination with other vegetable protein (viz. pea protein) it can prove a satisfactory protein source for poultry birds (ducks and hens). A supplement of animal protein is not necessary in a layer ration. These results are tentative, and need to be confirmed KMD

1955 PANDEY (NK). Frozen storage of poultry : A review. *Indian Food Packer.* 34(6); 1980; 39-43

Review includes: various freezing methods; rate of freezing and location of ice formation, pre-freezing treatments; effect of different packaging material, frozen storage effects and effect of thawing. BSN

1956 PROUDFOOT (FG), HULAN (HW) and McRAE (KB). The effect of several different photoperiods on the performance of meat-parent genotypes. *Can. J. Anim.Sci.* 60(1); 1980; 21-31

1957 YI JUNG and ZHOU (YL). The pekin duck in China. *World Anim. Rev.* No.34; 1980; 11-4

## QUAIL

1958 SHARMA (RK). Studies to estimate the cost of production of quails. *Poult. Guide.* 18(3); 1981; 39-40

The cost of the chick forms 53.3% of the total cost of producing a 6-week old quail. The cost of producing a fertilized egg has been estimated as Rs.0.39, a day-old chick as Rs.1.08, and a 6-week-old quail as Rs. 3.30. KMD

WHITE LEGHORN HEN

1959 BORTLETT (BE). Meeting the aminoacid requirement of layers. *Poult. Guide.* 18(3) 1981; 77-82

On comparing the aminoacid requirements for a laying white leghon hen, with the estimated intake of aminoacids from a practical diet, the author concludes that the methionine and lysine levels need the closest attention, while isoleucine and tryptophane levels should also be watched. Diets should be formulated specifically for summer periods and reformulated for the rest of the year; a further formulation for winter may be warranted. The formula of a practical diet for autumn and spring has been given as an example. KMD

## SEAFOODS

FISH

1960 EMEROLE (GO). Carcinogenic polycyclic aromatic hydrocarbons in some Nigerian foods. *Bull. Environ. Contam. Toxicol.* 24(5); 1980; 641-6

In fish smoked meat samples, (consumed as food by people in Nigeria) the concentration of 1.2 benzanthracene and 3.4 benzo(a)pyrene ranged from 2.5 ± 0.5 to 15.5 ± 2.5 and traces to 8.5 ± 2.0% respectively. It is probable that the high incidence of stomach cancer within the population in Ibadan city, Nigeria, may be traced to the presence of the two carcinogens in their diet. BSN

1961 HAIG AGEMIAN, STURTEVANT (DP) and AUSTEN (KD). Simultaneous acid extraction of six trace metals from fish tissue by hot-block digestion and determination by atomic-absorption spectrometry. *Analyst.* 105(1247); 1980; 125-30

The simple, rapid digestion method for simultaneous acid extraction of chromium, copper, zinc, cadmium, nickel and lead from high fat fish tissue involves digestion of sample with nitric acid sulphuric acids at 150 C in a modified aluminium hot-block. After digestion, acid extracts are analysed by direct flame atomic absorption spectrometry for copper, zinc and chromium. For estimation of cadmium, nickel and lead, the extract is concentrated by with ammonium tetramethylene dithio carbamate followed by solvent extraction wit isobutyl methylketone followed by solvent extraction with isobutylmethylketone. Subsequently by employing flame atomic-absorption spectrometry, cadmium,nickel and lead are estimated. The method is specially recommended for fish sample sizes upto 5 g for low level detection of the six elements involved. BSN

1962 MIRVISH (SS), KARLOWSKI (S), CAIRNES (DA), SAMS (JP), ABRAHAM (R) and NIELSEN (J). Identification of alkylureas after nitrosation-denitrosation of a bonito fish product. crab, lobster and bacon. *J. Agric. Food Chem.* 28(6); 1980; 1175-82

1963 SRINIVASA GOPAL (TK), ANTONY (KP) and GOVINDAN (TK). Packaging of fish and fishery products : Present status and future prospects. *Seafood Exp. J.* 13(1); 1981; 15-21

The author has discussed the packaging that would be suitable in India for fresh, and iced fish, frozen fishery products, canned fish, salt-cured and dried fish, fish meal, prawn pickle and fish sausage. KMD

1964 WARTHESEN (JJ), WALETZKO (PT) and BUSTA (FF). High-pressure liquid chromatographic determination of hypoxanthine in refrigerated fish. *J. Agric. Food Chem.* 28(6); 1980; 1308-9

HPLC technique involving extraction separation and quantification procedures give a rapid and direct measure of the hypoxanthine present in refrigerated fish tissue. Coefficient of variation for the method was 4%, with recovery of added hypoxanthine to fish at 92%. Accumulation of hypoxanthine in white fish held at 10C may be determined by the method. BSN

*SARDINE*

1965 OKAZAKI (E), KANNA (K) and SUZUKI (T). Manufacture of meat-textured fish protein concentrate from sardine. *Bull. Jpn. Soc. Sci. Fish.* 46(6); 1980; 727-32 (Japanese)

Meat textured fish protein concentrate (MT-FPC) was produced. Minced sardine meat was washed with 0.4% $NaHCO_3$ was adjusted to pH 7.4-7.8; NaCl was added up to 1% and the mixture was kneaded resulting in a viscous paste. It was extruded through a mincer into ethanol at 25-30 C. After being stirred for 15 minutes the mixture was filtered through cloth to collect the meat. After boiling in ethanol at 80-85 C for 15 minutes it was filtered and air dried to 13% moisture. KAR

1966 TAGUCHI (T), WATANABE (N), TANAKA (M), SUZUKI (K), SAITO (A) and OUCHI (M). Quality of evaluations of canned sardines. *Bull. Jpn. Soc. Sci. Fish.* 46(6); 1980; 739-42

The study was conducted to obtain a simple chemical index for the quality of canned sardines. The sardines stored in ice and their canned products: the k-value, IMP ratio and Hx-ratio on the basis of nucleotide composition were examined. The quality of the canned fish depended on the freshness of the raw fish. The aggregation reaction of liquid portion of canned sardines by PCA is reported in connection with their sensory scores. KAR

*KRILL*

1967 FLECHTENMACHER (W) and WANKE (W). Spray dried protein concentrate from Antarctic Krill cleaned by centrifuging. *Food Sci + Technol.* 12(4); 1979; 194-8 (German)

In trials of spray drying raw materials from freshly caught Antarctic Krill (*Euphausia superba Dana*), cleaned by centrifuging from the liquid content of the intestinal organs unwanted in food processing, the sensory quality of the powder was tested immediately after drying. The centrifuged material gave better results compared to not centrifuged one from the same haul; this also happened to powder from Krill left in raw condition as well as to powder from Krill, which was cooked by steaming after centrifuging. AA

*SHRIMP*

1968 GOPALAN (UK) and PURUSHAN (KS). Present status of brackish water shrimp culture in India. *Seafood Exp. J.* 13; 1981; (1) 9-14; (3) 11-9

The authors have reviewed the results of research on shrimp culture in brackish waters in India. The species considered fit for culture are the salt-water shrimps *Penaeus monodon*, (or Indian tiger prawn), *P. indicus*, and *P. merguiensis*, and the fresh-water shrimp *Macrobrachium rosenbergi* (the giant fresh-water prawn). *P.monodon* and *M.rosenbergi* have the largest size among the salt-

water and fresh-water shrimps, respectively. The various methods of culture and breeding have been dealt with in some detail. An assessment of the economic possibilities has also been arrived at. The annual yield of shrimps can go as high as 965 kg/ha.in paddy fields fetching a profit of Rs.2,365; while in a constructed pond the annual yield may be as high as 1400 kg/ha, fetching a profit of Rs. 8,000 (or 32% on fixed capital). KMD

*MUSSEL*

1969 SUNDARARAJ (V), NATARAJAN (P) and KUTHALINGAM (MDK). Scope for mussel farming in brackish waters. *Seafood Exp. J.* 13(3); 1981; 21-3

## PROTEIN FOODS

Nil

## FRUIT JUICES AND BEVERAGES

*FRUIT JUICE*

1970 ANON. DLG quality tests for fruit juices, fruit juice based beverages and fruit wines - prize winners. *Flussiges Obst.* 46(12); 1979; 477-83 (German)
Out of the fruit juices, fruit beverages and fruit wines tested in 1979 by the DLG (i.e. German Agricultural Society), 13% received the grading "excellent", 20% the grading "very good", and 32% the grading "good". Most of the entries that did not win a prize were defective in odour or taste. Among them, the apple wines had too low an alcohol content and the dessert wines a too low volatile acid content. KMD

1971 FROHLICH-MERZ (G). 50 years "Flussiges Obst" - as well half a century of history of the German fruit juice industry. *Flussiges Obst.* 46(12); 1979; 462-8 (German)

1972 LEIPZIGER (JW). The importance of public relations of associations with examples of the PR activities by the association of the German fruit juice industry. *Flussiges Obst.* 46(10); 1979; 387-8 (German)

1973 SEMMLER (G). Fruit juices, fruit nectars and juice-based beverages in dietetics. *Flussiges Obst.* 46(10); 1979; 382-6, 449 (German)
Fruit juices are of great value in special diets as they are excellent sources of vitamin C and minerals and help to maintain a desired Na/K balance. The carbohydrate contents, viz. the sugars and fruit acid must also be kept in mind. Hence, conditions may arise in which the use of fruit juices is banned. KMD

1974 WIRTZ (A). The quality mark by the CMA and its application in the fruit juice industry. *Flussiges Obst.* 46(12); 1979; 475-7 (German)

## CITRUS

1975 UBACH (Von K) and BREYER (Ch). Isotachophoretic determination of ascorbic acid content in diluted concentrates of citrus juices. *Dtsch Lebensmittel-Rundschau.* 76(7); 1980; 228-21 (German)

Ascorbic acid and dehydroascorbic acid, after reduction with mercaptoethanol, more in a electric field as anions and can be separated from other interference substances by isotachophoresis. The width of the UV-signal at 254 nm is directly proportional to the amount of ascorbic acid. 46 samples of citrus juices were used for estimating the ascorbic acid content. The rate of recovery of the isotachophoretic method has a mean value of 97%. The coefficient of variation with a number of determination n = 5 per sample amounts to values less than 2%. KMD

## ORANGE JUICE

1976 BAYER (S), McHARD (JA) and WINEFORDNER (JD). Determination of the geographical origins of frozen concentrated orange juice via pattern recognition. *J.Agric. Food Chem.* 28(6); 1980; 1306-7

By employing techniques of pattern recognition, concentrations of five out of 28 elements determined earlier in the frozen concentrated orange juice samples from Brazil and Florida, were found to adequately act as discriminators of the geographical region of origin. BSN

1977 NAGY (S), ROUSEFF (R) and TING (SV). Effects of temperature and storage on the iron and tin contents of commercially canned single-strength orange juice. *J. Agric. Food Chem.* 28(6); 1980; 1166-9

Accelerated rates of detinning occured at higher temperatures in commercial cans packed with single strength orange juices. At the end of a 12-week period the mean weekly rates of tin uptake (mg of sn/kg juice-week) were: 0.4(21.1 C-70 F), 0.8 (26.7 C), 1.5 (32.2 C), 2.4 (37.8 C), 4.0 (43.3 C) and 12.5 (48.9 C). Iron uptake was minimal as orange juice was not strongly corrosive to plain carbon steel plate. Storage below 43 C, should not result in tin content exceeding 250 ppm, if the juice is stored for 12 weeks or for a lesser period. BSN

## APPLE JUICE

1978 KOCH (J). Determination of the proportion of apple juice in apple-juice-based drinks. 1. Can one determine the juice conent of apple-juice-based beverages from the guide-lines for fruit juices? *Flussiges Obst.* 46(12); 1979; 470-4 (German)

The author has discussed in detail the quality standards and guide lines formulated for the production and labelling of apple juices. He concludes that by chemical estimation of the contents of the titratable total acids, l-malic acid, citric acid, and possibly also tartaric acid, one cannot arrive at the quantity of fruit acids - i.e. acids derived from the fruits themselves - that are present in the beverage; hence no firm conclusion regarding the quantity of apple juice used to prepare the beverage can be reached. KMD

## SOFT DRINK

1979 GILLYON (ECP). The use of liquid chromatography in the quality control of soft drinks. *Chromatogr. Newslet.* 8(2); 1980; 50-1

1980 WILD (R). Quality criteria for soft drinks. *Flussiges Obst.* 46(10); 1979; 394-5 (German)

German soft drinks have the highest quality standards on the international plane. The selection and processing of citrus fruits into natural compounds, essential oils and distillate essences has been dealt with. KMD

## COFFEE

1981 CLINTON (WP), MANNI (PH) and FERRY (JM). Mass loss on drying for instant coffee. Collaborative study. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 178-9

A collaborative study was undertaken to define an acceptable routine working method for determination of mass loss in instant coffee. Fourteen laboratories of 24 invited to participate submitted results. The repeatability standard deviation and coefficient of variation were 0.026 and 0.7%, respectively. The reproducibility standard deviation and coefficient of variation were 0.153 and 3.8%, respectively. The method has been adopted as official first action. AA

1982 BREITENACHER (M). Alcoholic beverages are losing parts of the market. *Flussiges Obst.* 46(12); 1979; 483-5 (German)

1983 GEISS (Th). Beverage preparing formulas : Examination, calculation and technical aspects of beverage mixing. *Flussiges Obst.* 46(11); 1979; 422-30 (German)

The cost of beverage production depends almost entirely on the beverage preparing formula and the prices of the raw materials that are purchased. Hence, the person responsible for buying should be capable of controlling the beverage formulas and hence also the dosing costs. KMD

1984 BRANDON (H), RENAUD (J), STAACK (G) and PUSKARZ (S). Assessment of energy conservation/new energy systems in the brewing industry. *MBAA Tech. Quart.* 17(1); 1980; 24-33

1985 MULLONEY (JA) Jr., PARKER (AJ) Jr. and TIMBARIO (TJ). The potential role of the United States brewing industry in the production of ethyl alcohol for fuel use. *MBBA Tech. Quart.* 17(1); 1980; 44-8

1986 HYSERT (DW), WEAVER (RL) and MORRISON (NM). The origin and control of dimethyl sulfide and its precursor in malt. *MBAA Tech. Quart.* 17(1); 1980; 34-43

## WINE

1987 DONATH-JOBBAGY (A) and HOLLO (J). Bouquet qualification of wines by gas chromatography. Part 5. Detection of an improvement and determination of its extent. *Nahrung.* 23(8); 1979; 797-806 (German)

In our earlier investigations, a method based on "headspace" analysis by gas chromatography combined with mathematical statistical evaluation was developed for the objective bouquet qualification of wine. A study of the applicability of the basic procedure showed, however, the bouquet of samples with different degrees of dilution and that of the original wine to be identical, within the limit of experimental error. The method was, therefore, further developed and has been rendered applicable both on theoretical and experimental basis for the determination of the "watering" of wine and the degree of dilution. AA

1988 VAHL (JM) and CONVERSE (JE). Ripper procedure for determining sulfur dioxide in wine. Collaborative study. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 194-9

$SO_2$ is used in wine as an antimicrobial and antioxidant agent. Direct iodometric method by Ripper is most commonly used. This method determines both free and total $SO_2$. Although rapid and convenient, the method is severely limited by poor precision and large systematic error. The Ripper method is not recommended for adoption by the AOAC. BSN

*BEER*

1989 WETTSTEIN (DV), JENDE-STRID (B), AHRENST-LARSEN (B) and ERDAL (K). Proanthocyanidin-free barley prevents the formation of beer Haze. *MBAA Tech. Quart.* 17(1); 1980; 16-23

*GIN*

1990 NOUT (MJR). The manufacture and composition of Chang aa (Nubian gin). *Food Sci + Technol.* 12(4). 1979; 212-6

The manufacture of Chang'aa has been described. The compositions 33 commercial samples of known history, have been reported and related to: (a) the regions of origin; (b) the ingredients used for mash preparation; (c) the distillation technique employed; and (d) the odour of the final product. A comparison of the distillation equipment used in urban and rural areas respectively showed that the former yielded a product of higher quality. Nine samples were of satisfactory quality, while the remaining 24 had to be rejected because of excessive contents of fusel alcohols. KMD

## OILS AND FATS

1991 HARTMAN (L), CARDOSO ELIAS (M) and ESTEVES (W). Method for the determination of phosphorus in lipids and lipid-containing materials. *Analyst.* 105(1247); 1980; 173-6

1992 HENZE (R). Dielectric relaxation in lecithin/cholesterol/water-mixtures. *Chem. Phys. Lipid.* 27(2); 1980; 165-75

1993 HAYASHI (M), KOBAYASHI (T), SEIMIYA (T), NURAMATSU (T) and HARA (I). Ionic properties of phospholipids at the oil/water interface. *Chem. Phys. Lipid.* 27(1); 1980; 1-8

1994 ROBBINS (SRJ) and GREENHALGH (P). The markets for selected herbaceous essential oils. *Trop. Sci.* 21(2); 1979; 63-70

The herbaceous oils discussed in this article are: rosemary oil; dill oil (from weed and seed); marjoram, thyme, origanum and related oils; sage oil (Dalmatiam and Spanish); celery seed oil; fennel oil (bitter and sweet); basil oils (sweet and Reunion-type); parsley oil ( from herb and seed); bay (laurel leaf), tarragon, chervil, savory and garlic oils. Of these, only a few, viz. dill weed oil, celery seed oil and basil oil offer any prospects worth considering at all; and even in these cases the quantities involved would be small or very small. Other oils that are in short supply at present are sage, wild marjoram, thyme and origanum. Thus, herbaceous oils offer limited, but still significant, potential to a limited number of new producers in the developing

countries, although only as secondary crops. KMD

1995 SINGH (AK), ANUPAM DIKSHIT, SHARMA (ML) and DIXT (SN). Fungitoxic activity of some essential oils. *Econ. Bot.* 34(2); 1980; 186-90

Of the tive essential oils screened against *Helminthosporium oryzae*, the oils of *Cymbopogon martinii* (ginger grass oil), *Cymbopcgon oliveri*, *Cymbopogon sp.* (rosa sofia oil) and *Trachyspermum ammi* (dethymolysed oil) exhibited strong fungitoxicity and showed wide range of activity. The oils were found more active than some of the prevalent synthetic fungicides and thus might be exploited as natural fungicides if successful in field trials Besides, these oils were found toxic to various human pathogens. KAR

1996 DAMIANI (P) and BURINI (G). Determination of the triglyceride composition of olive oil by a multistep procedure. *J. Agric. Food Chem.* 28(6); 1980; 1232-6

1997 SCHEUTWINKEL-REICH (Von M), INGEROWSKI (G) and STAN (H-J). Investigating frying fats with a view to possible mutagenic effects by means of the Ames test. *Dtsch. Lebensmittel-Rundschau.* 76(7); 1980; 231-3 (German)

Processed deep frying fat fractions were studied for possible mutagenicity using the Salmonella/Microsome test according to B.N. Ames, the fat fractions tested were i) the 'polar fraction; according to Guhr, consisting of dimeric and polymeric triglycerides and ii) the 'oxidized fatty acid fraction' which is isolated as the petroleum ether insoluble residue. Both fractions are currently used in Germany as criteria for the recognition of spoilage of deep frying fats. The Ames test was performed both with and without metabolic activation. The results showed the mutagenic effects of the fat fractions with the tester strains TA 1535, TA 1537, TA 1538, TA 98 and TA 100. AA

## SPICES AND CONDIMENTS

1998 DHAR (AK). Improved methods of the determination of common salt in spices. *Sci. Cult.* 46(11); 1980; 397-8

In this method common salt is extracted from ground spices, by $CCl_4$; it will then be free from any interfering pigments. The solvent is evaporated on water bath in a fuming chamber and the estimation is done by titration and flame photometric methods with almost identical results. MVG

### *GARLIC*

1999 SHASHIKANT (KN), BASAPPA (SC) and SRINIVASA MURTHY (V). Studies on the anti-microbial and stimulatory factors of garlic (*Allium sativum* Linn.). *J. Food Sci. Technol. (India).* 18(2); 1981; 44-7

Raw garlic extract was stored for 48 hour at 26-30 C and its effect on *S. facealis* and *E. coli* cultures was noted at regular intervals. The anti-microbial activities of garlic extract are stable beyond 48 hour when stored at 37 C and was stable for 36 hour at 58 C storage. The anti-fungal activity against *Aspergillus flavus* and *P. citrinum* was noted upto 8 hours at these storage temperatures. The component of the broth used for testing the activity have shown an antagonistic effect on enzyme activity and on alliin as such. Cooked garlic extract stored up to 24 hours at 26-30 C showed a significant growth stimulating activity of bacterial and fungal cultures. It has been shown that the stimu-

latory activity is not due to alliin, cooked alliin, carbohydrates and organic N but due to dialysable ninhydrin positive compound. KAR

*TURMERIC*

2000 GOVINDARAJAN (VS). Turmeric : Chemistry, technology and quality. *CRC Crit. Rev. Food Sci. Nutr.* 12(3); 1980; 199-301

Review discusses : botanical derivation (cultivated varieties, cultivation, diseases and pests, harvesting, yields, seed material, preparation for the market, curing, drying, polishing, storage improvement of varieties, curing and drying) structure and composition (chemical composition), microbiological contamination and its control, insect infestation and control), packaging, storage and transportation of whole turmeric, adulteration of turmeric and its products and its detection; standards and grade specifications· production, consumption and trade in turmeric (production, consumption, trade, international trade) processed products (ground turmeric, packaging, turmeric oleoresin, extraction and control, quality control, economics and prospects, standards and specifications for turmeric oleoresin, curry powder, packaging and storage), chemistry of turmeric colour, chemistry of turmeric volatile oil and its chemical composition, evaluation of quality (colour, aroma), functional properties and uses in food (storability, whole turmeric vs extracts, antioxidant properties), allied spices (*Curcuma aromatica satisb Roxb, Curcuma zeodeodoaria Roscoe, Curcuma amada. Roxb, Curcuma caesia Roxb*), biosynthetic aspects (colour compounds, aroma compounds), physiological and toxicological aspects and overview. BSN

*PEPPER*

2001 SREEDHARAN (VP), MANGALAKUMARI (CK) and MATHEW (AG). Staining technique for the differentiation of papaya seed from black papper. *J. Food Sci. Technol. (India)* 18(2); 1981; 65

Adulteration of black pepper with papaya seeds can be detected by treating the cut sections with 1% iodine in 1% aqueous potassium iodide solution. Pepper gives deep blue colour and papaya seeds produce pale red colour. KAR

*CARDAMOM*

2002 VARKEY (GA), GOPALAKRISHNAN (M), THOMAS (PP) and MATHEW (AG). Artificial drying of cardamom. *Cardamom.* 13(3); 1981; 3-9

The dried green cardamom capsules of the plant *Elettaria Cardamomum* Maton have a greater demand in West Asian market. India is the principal exporter of cardamom and earns about Rs. 49 crores annually from export. The Alleppey green cardamom accounts for 90 to 95% of export and is preferred for its superior quality. The freshly picked capsules contain about 80% moisture and this has to be dried to 8 to 9% for trade or for storing. Conventionally green cardamom is processed in flue type driers. A forced hot air circulated drier was found to give satisfactory results. Flushing of hot humid air, though slightly costlier, was found to result in better green colour. Based on these with other governing factors such as optimum temperature and bed thickness a drier capable of drying 120 kg was fabricated and tested in field conditions. AA

## SENSORY EVALUATION

Nil

## FOOD STORAGE

Nil

## INFESTATION CONTROL AND PESTICIDES

2003 THOMAS (PM). Role of pesticides in rural development. *Pest Problems*. 3(1); 1981; 6-8

2004 VARMA (BK). Pest control in stored grains. *Pest Problems*. 3(1); 1981; 9-12

2005 BEHL (YS). Pesticide resistance. *Pest Problems*. 3(1); 1981; 13-4

2006 VENUGOPAL (JS), HIRANNAIAH (BV) and MAJUMDER (SK). New technique of derivative thermal monitoring calcium orthophosphate - a food preservative in a binary system. *J. Food Process. Preserv.* 4(3); 1980; 211-5

The preservative and nutritional qualities of calcium orthophosphate (TCP) has been previously reported. However, its protective use in processed foods and flour is mainly based on the purity of the salt. Most of the commercial salts screened were found to contain dicalcium orthophosphate as an impurity which is beneficial to insect breeding. A new quantitative method has been described for the estimation of TCP content in a binary phosphate system. The method is based on monitoring the solid phase decomposition of two salts under a controlled thermal environment. A unique technique of measuring the intermediary decomposition phase and estimating the adulterant in TCP is described and the thermal reactions are discussed. AA

2007 CHIN (BH), TALLANT (MJ), DUANE (NC) and SULLIVAN (LJ). Anticholinesterase effects of carbamate insecticide thiofanox and its metabolites in rats. *J. Agric. Food Chem.* 28(6); 1980; 1327-30

2008 STIJVE (T). Thin-layer chromatographic determination of chlormequat residues in various substrates. *Dtsch. Lebensmittel-Rundschau.* 76(7); 1980; 234-7 (German)

In the proposed method for the determination of chlormequat (2-chloroethyl trimethylammonium chloride), the residues of this plant growth regulator are extracted with methanol, cleaned up over an aluminium oxide column and determined after thin layer chromatographic separation, either by visual estimation or by densitometric measurement of the spots detected with Dragendoraf reagent. The method was successfully applied to various cereals, straw, pears, grapes, raisins and to milk and milk products. Recoveries ranged from 70 to 103%. The limit of determination for milk, one of the more difficult substrates, was 0.05 mg/kg. AA

2009 VEIEROV (D) and AHARONSON (N). Improved cleanup of large lipid samples of electron capture gas chromatographic quantitation and gas chromatographic - mass spectrometric confirmation of organochlorine residues. *J. Assoc. Off. Anal.*

*Chem.* 63(2); 1980; 202-7

A new method for large lipid samples is described for the analysis of organochlorine traces. This method allows both electron capture gas chromatographic quantitation of sub-ppb levels and confirmation by GC-mass spectrometry. Lipid exracted with concentrated $H_2SO_4$ from a 2-5% solution of light petroleum ether. The method is characterized by low lipid carry over of 0.02% by minimal use of solvent. 50-200 g sample can be cleaned up in one day. 5 µg of incurred p, p'-DDF could be cleaned up from a 50 g butterfat sample and purified by one TLC run. The eluted compound was analyzed by GC-MS. BSN

2010 VISHWAMBHARAN (PR). Fumigants and fumigation procedures. *Food Crop.* 10(12); 1980; 7-8

## BIOCHEMISTRY AND NUTRITION

2011 ALBRECHT (R), DOOH-PRISO (E), FAUDEMAY (F), PELISSIER (MA) and CARREAU (JP). Induction by lindane of microsomal mono-oxygenases of the rat liver ; effects of a hyperlipidic diet. *Food Cosmet. Toxicol.* 17(5); 1979; 463-71 (French)

It seems possible that in the rat fed both lindane and a high-fat diet, there may be a deficiency of NADPH for hepatic metabolism of hexobarbital. KMD

2012 YOUNG (ME), CARROAD (PA) and BELL (RL). Estimation of diffusion coefficients of proteins. *Biotechnol. Bioeng.* 22(5); 1980; 947-55

2013 AMOS (HE), EVANS (JJ), HIMMELSBACH (DS) and BARTON (FE). *In vitro* stability, *in vivo* hydrolysis and absorption and of lysine and methionine from polymerized amino acid preparations. *J. Agric. Food Chem.* 28(6); 1980; 1250-4

2014 ANON. Recommended dietary allowances revised 1980. *Dairy Coun. Dig.* 51(2); 1980; 1-12

2015 BERGAN (JG) and BROWN (PT). Nutritional status of "new' vegetarians. *J. Am. Diet. Assoc.* 76(2); 1980; 151-5

2016 DWYER (JT), MILLER (LG), ARDUINO (NL), ANDREW (EM), DIETZ (WZ) Jr., REED (JC) and REED (HBC) Jr. Mental age and I.Q. of predominantly vegetarian children. *J. Am. Diet. Assoc.* 76(2); 1980; 142-7

2017 ANON. Current infant feeding practices. *Dairy Coun. Dig.* 51(1); 1980; 1-5

2018 KAPOOR (CM) and GUPTA (SK). Nutritional evaluation of MDRI soy-whey weaning food. *J. Food Sci. Technol. (India).* 18(2); 1981; 67-9

The soy-whey weaning food developed (see this Journal 1981, 18(2), 55) was evaluated for protein efficiency ratio (PER) at various stages of manufacture and during storage in polyethylene bags (PE) and tins for one year. The PER of blanched soybean was 2-6, soy-whey powder was 2.9 and after addition of methionine (1.12 g/16 g N) was 4.1. The PER decreased during storage at 5 and 30 C to 2.5 and 1.9 in PE stored and to 2.5 and 2.2 in tin stored products respectively. KAR

2019 KAPOOR (CM) and GUPTA (SK). Soy-whey weaning food. I. Method of manufacture. *J. Food Sci. Technol. (India).* 18(2); 1981; 55-8

A weaning food rich in protein (22.9%) was prepared using soybean and cheese whey. The manufacturing method consisted of soaking, blanching and dehulling soy beans, grinding the soy-whey mixture, adding oil and oil soluble vitamins,

homogenizing, spray drying, fortifying with other vitamins, flavouring and packaging. The soy to whey solids ratio of 35:65 and homogenization is done in two stages with 3000 and 500 lb/square inch were found optimum. Other properties are: solublity index 7.3 ml, bulk density 0.656 g/ml and viscosity (10% TS in water) 2.029 centi pois at 30 C. The product was free from trypsin inhibitor activity and was acceptable with or without added flavour. The cost is Rs.4.86/kg. KAR

2020 KAPOOR (CM) and GUPTA (SK). Soy-whey weaning food. II. Storage studies. *J. Food Sci. Technol. (India)*. 18(2); 1981; 58-61

The soy-whey weaning food prepared by the authors (see previous paper) was packed in 300 guage polyethylene bags (P) and lacqured tin cans with N (TN) and without N (T) and stored at 5 ± 2 C and 30 ± 1 C with 80% RH for 12 months. Analysis done at regular intervals for physical and chemical properties indicated packing in P deteriorated faster than that in TN or T at both the temperatures; the higher temperature being more conducive for spoilage At 5 ± 2 C and 30 ± 1 C the product packed in P could be stored for 7 and 4 months and in T for 10 and 6 months respectively. In TN it kept well for 12 months at both the temperatures. KAR

## *VITAMIN*

2021 DONG (MH), McGOWN (EL), SCHWENNEKER (BW) and SAUBERLICH (HE). Thiamin, riboflavin and vitamin $B_6$ contents of selected foods as served. *J. Am. Diet. Assoc.* 76(2); 1980; 156-60

2022 McLAUGHLIN (PJ) and WEIHRAUCH (JL). Vitamin E content of foods. *J. Am. Diet. Assoc.* 75(6); 1979; 647-65

Compilation of data on vitamin E content for meat, animal products, plant and plant products and miscellaneous and prepared foods. BSN

2023 PADEN (CA), WOLINSKY (I), HOSKIN (JC), LEWIS (KC), LINEBACK (DR) and McCARTHY (RD). Fortification of accessory food items with vitamin A. *Food Sci + Technol.* 12(4); 1979; 183-8

In addition to staple foods - e.g. wheat flour, bread - accessory foods such as sugar, monosodium glutamate (MSG), tea, vil and salt may be excellent vehicles for foritification with vitamin A and may have the advantage of being more widely and more uniformly consumed by the target population(s). The authors have reviewed research directed at using the aforesaid commodities as vehicles for supply of vitamin A and conclude that all of them could be appropriate vehicles for vitamin A fortification. KMD

2024 TELEGDY-KOVATS (L), KRASZNER-BERNDORFER (E), PAP (I), GABOR (T) and SZTRAKA (L). New data on the structure of pangamic acid. *Nahrung*. 23(8); 1979; 775-83 (German)

Owing to its favourable physiological properties, the clinical use of pangamic acid (vitamin $B_{15}$) is assuming ever greater importance in more and more countires and the knowledge of agricultural products and foods with prophylactic activity is becoming an urgent task in nutritional physiology. A reliable reference substance is required for qualitative and quantitative appreciation and the bio-active (e.g. lipotropic) activity is yet not sufficiently elucidated. The results from many years of systematic studies of the authors permit the conclusions that not all synthetic preparations have a structural formula which corresponds to that indicated by Krebs. Prior to any application (as a drug, vitamin, reference substance, etc.), a careful control, at least by infrared spectrometry, is necessary. The bio-active activity which is in general

associated with methylation and transmethylation reactions requires the existence of labile methyl groups or the concomitant action of a still unknown activating factor. The present paper affords evidence of a protonization under certain conditions, leading to the formation of a quaternary nitrogen atom. This phenomenon might play an important part in the clinically demonstrated bio-action. AA

2025 VANDERSLICE (JT), MAIRE (CE), DOHERTY (RF) and BEECHER (GR). Sulfosalicylic acid as an extraction agent for vitamin $B_6$ in food. *J. Agric. Food Chem.* 28(6); 1980; 1145-9

Describes procedure for preparation of extracts from foods free from interfering compounds for HPLC estimation of vitamin $B_6$ in foods. Recoveries of vitamin $B_6$ added to samples were 95-105%, except in the case of pyridoxine phosphate, which showed a recovery of 85% only. Higher amounts of vitamin $B_6$ were found in foods than normally expected from literature values, except for breakfast cereals. BSN

2026 VILLOTA (R) and KAREL (M). Prediction of ascorbic acid retention during drying. II. Simulation of retention in a model system. *J. Food Process. Preserv.* 4(3); 1980; 141-59

Kinetics of degradation of ascorbic acid as a function of moisture content and temperature has been examined to predict ascorbic acid retention during air-drying of food materials. The degradation was found to follow a first order reaction and is highly moisture and temperature dependent. Development of a mathematical model for ascorbic acid degradation as a function of moisture, temperature and time has been worked out. AA was determined by high speed liquid chromatography on a strong anion exchange column. Maximum rate of degradation was observed to occur at 60% moisture, higher the temperature of drying the lower the retention of ascorbic acid. BSN

2027 KELLY (GJ) and LATZKO (E). Prospect of a specific enzymatic assay for ascorbic acid (vitamin C). *J. Agric. Food Chem.* 28(6); 1980; 1320-1

Ascorbate peroxidase, the enzyme present in plant leaves may be employed for estimation of ascorbic acid in fruits and vegetables. Data obtained agreed closely with those obtained from titration with 2,6-dichlorophenolindophenol. Rapid estimation with small samples (10-100 mg) of tissue becomes possible with this method. BSN

## TOXICOLOGY AND HYGIENE

2028 OBIDOA (O) and OBONNA (EE). Dihydroaflatoxin inhibition of energy-linked reduction of endogenous nicotinamide nucleotides in isolated rat-liver mitochondria. *Food Cosmet Toxicol.* 17(5); 1979; 501-4

2029 STOLOFF (L) and FRANCIS (OJ) Jr. Survey for aflatoxins and zearalenone in canned and frozen sweet corn. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 180-1

Aflatoxin and zearalenone were determined in 263 samples of canned or frozen sweet corn, collected from packing plants during the 1976 and 1977 packing seasons. As anticipated from geographic, agronomic and microbiological considerations, no aflatoxin or zearalenone was found. Based on this sampling, the highest incidence of detectable aflatoxin that could be statistically anticipated in the major packing areas is 1.5%. AA

2030 WONG (ZA), DECAD (GM), BYARD (JL) and HSIEH (DPH). Conversion of aflatoxicol to aflatoxin $B_1$ in rats *in vivo* and in primary hepatocyte culture. *Food Cosmet. Toxicol.* 17(5); 1979; 481-6

The biological potency of aflatoxicol and the correlation of its formation with species sensitivity to the carcinogenic effect of aflatoxin $B_1$ may be due to its ability to undergo oxidation to the parent toxin, aflatoxin $B_1$, allowing further bioactivation. AA

2031 GIMENO (A). Improved method for thin layer chromatographic analysis of mycotoxins. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 182-6

The author's previously published multimycotoxin method is improved by a series of changes in the development of the citrinin. Importance of the type of UV lamp and the use of a yellow filter are also emphasized. AA

2032 TAKAHASHI (O) and HIRAGA (K). 2,6-Di-tert-butyl-4-methylene-2,5-cyclohexadienone: A hepatic metabolite of butylated hydroxytoluene in rats. *Food Comset. Toxicol.* 17(5); 1979; 451-4

2033 COLLINS (TFX), BLACK (TN) and PREW (JH). Effects of calcium and sodium carrageenans and l-carrageenan on hamster foetal development. *Food Cosmet. Toxicol.* 17(5); 1979; 443-9

2034 WALTERS (CL), CARR (FPA), DYKE (CS), SAXBY (MJ), SMITH (PLR) and WALKER (R). Nitrite sources and nitrosamine formation *in vitro* and *in vivo*. *Food Cosmet. Toxicol.* 17(5); 1979; 473-9

2035 HANDA (SK). Spectrophotometric determination of carbofuran residues in water. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 200-1

A spectrophotometric method has been developed for the microdetermination of carbofuran in water. The method is based on the reaction of carbofuran phenol (2,3-dihydro-2, 2-dimethyl-7-hydroxy benzofuran) with nitric acid to form a coloured compound with an absorption maximum at 345 nm; residues in the range 10-150 µg/5 ml solution can be detected. Carbofuran is highly toxic to mammals. Chromatographic enzymatic colorimetric methods have been reported for its analysis. The colour in this method was stable for 4 hours. This can be applied satisfactorily to tap and field water samples. Prior removal of free phenols in water is necessary by treating the methylene chloride extract with 0.1 M $K_2Co_3$ solution. BSN

2036 TURNER (JC) and SHANKS (V). Absorption of some organochlorine compounds by the rat small intestine - *in vivo*. *Bull. Environ. Contam. Toxicol.* 24(5); 1980; 652-5

2037 THRASHER (JJ) and HANSEN (MA). Extraction and thin layer chromatographic confirmation of urine residues: New plate development. *J. Assoc. Off. Anal. Chem.* 63(2); 1980; 189-93

Urine contamination on food products could be detected by extracting the contaminated substance, concentration of the extract, separation of urinary compounds on a TLC and comparison with known urine standards. In this new method, allantoin should be stored in 90% acetone solution for not more than 3 months, the decomposition product appears as a separate spot on TLC plates, sample loss during extraction could be overcome by extracting on a steam bath with a large surface area. The authors have suggested that excessive amounts of spray should be avoided for detection. BSN

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